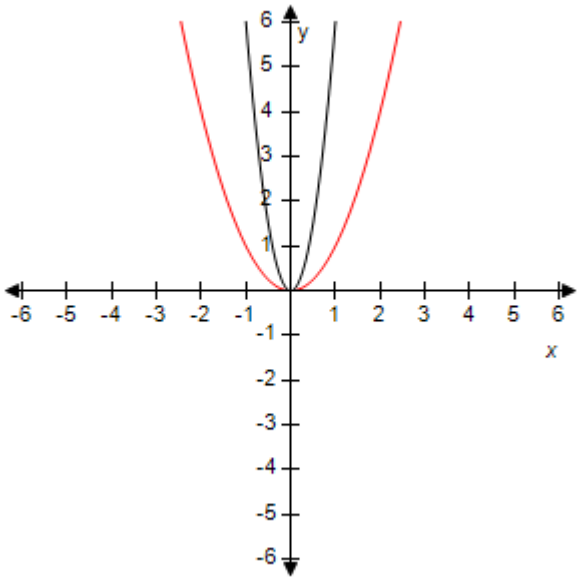
Precalculus Metric Version 11th edition Larson Test Bank

SKU: 9781473788176-TEST-BANK

Section 2.1 - Quadratic Functions and Models

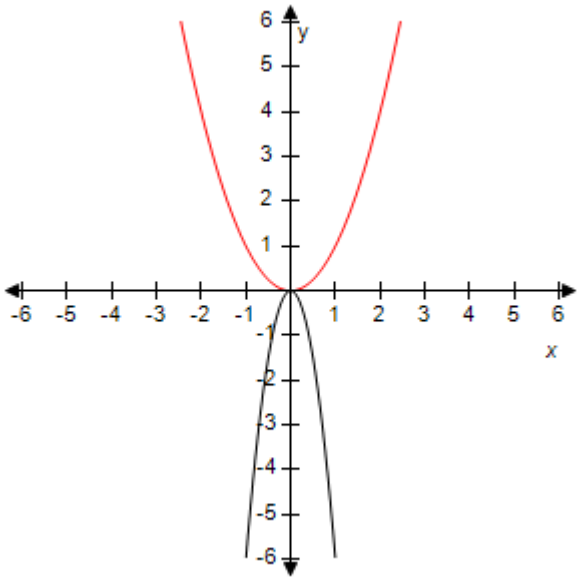
1. Select the graph of the function $y = -6x^2$. Compare the graph of this function with the graph of $y = x^2$.

a.



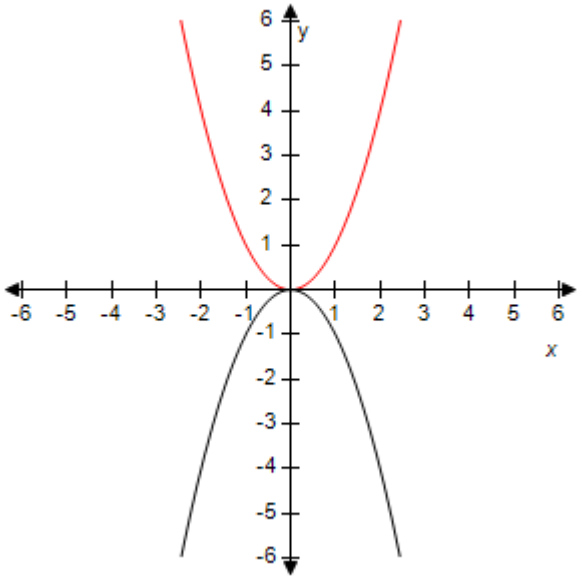
Vertical stretch

b.



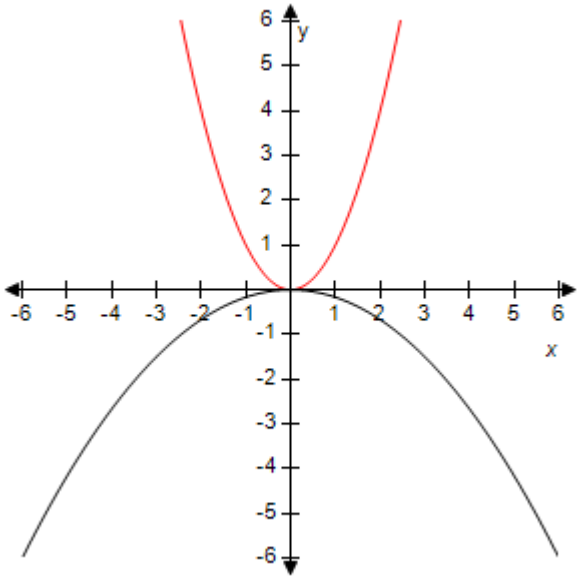
Vertical stretch and reflection in the *x*-axis

c.



Reflection in the *x*-axis

d.

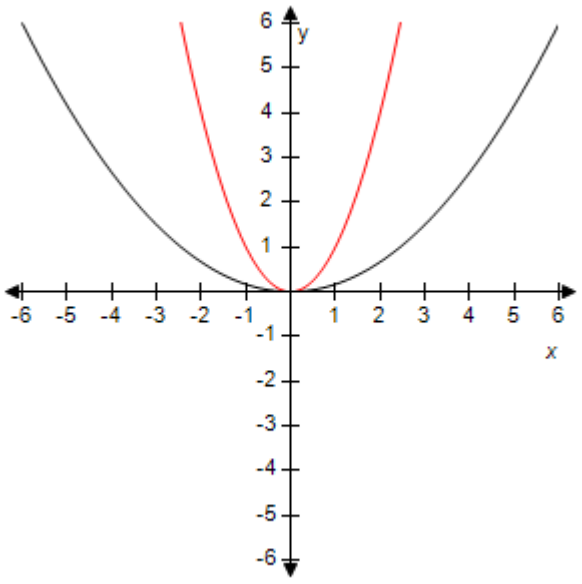


Vertical shrink and reflection in the *x*-axis

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e.



Vertical shrink

ANSWER: b
POINTS: 1
REFERENCES: 3.1.13d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:12 AM

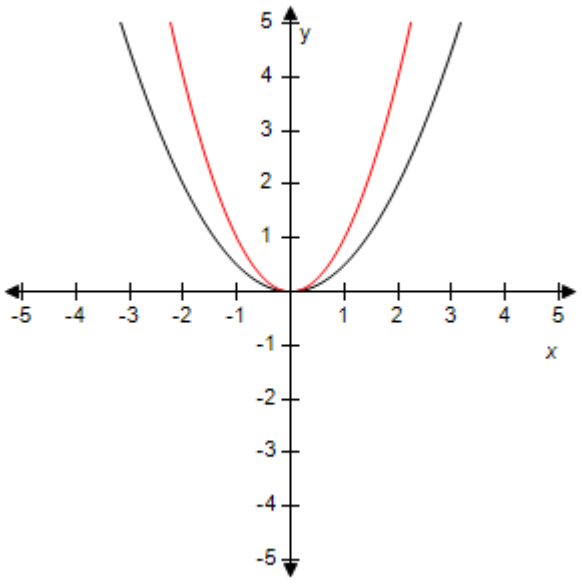
2. Select the graph of the function $y = \frac{3}{2}x^2$. Compare the graph of this function with the graph of $y = x^2$.

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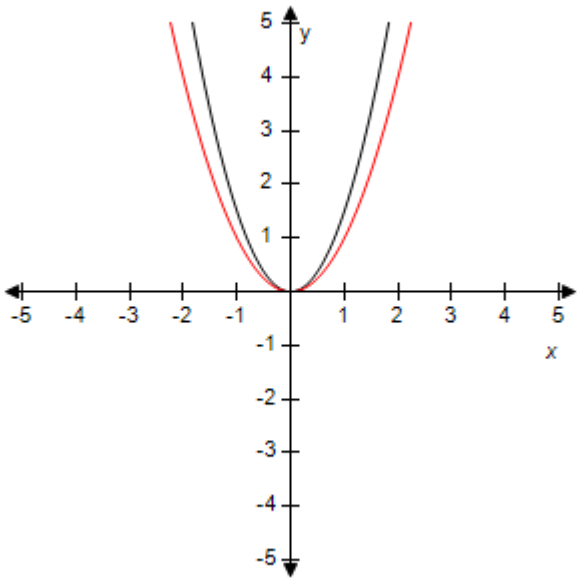
Section 2.1 - Quadratic Functions and Models

a.



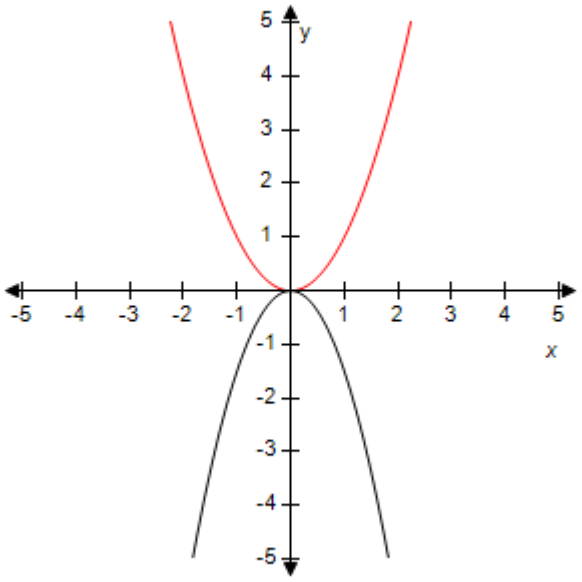
Vertical shrink.

b.



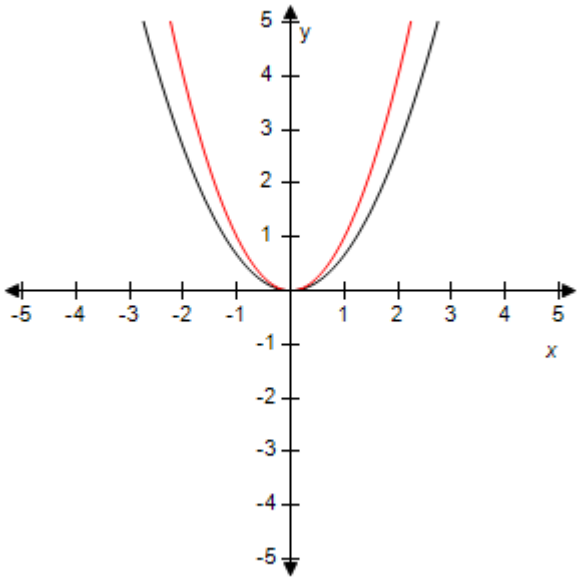
Vertical stretch.

c.



Vertical stretch and reflection in the *x*-axis.

d.

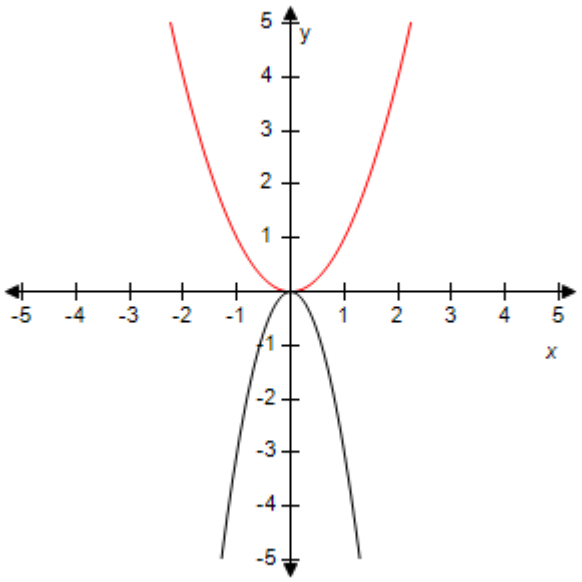


Vertical shrink.

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e.



Vertical stretch and reflection in the x-axis.

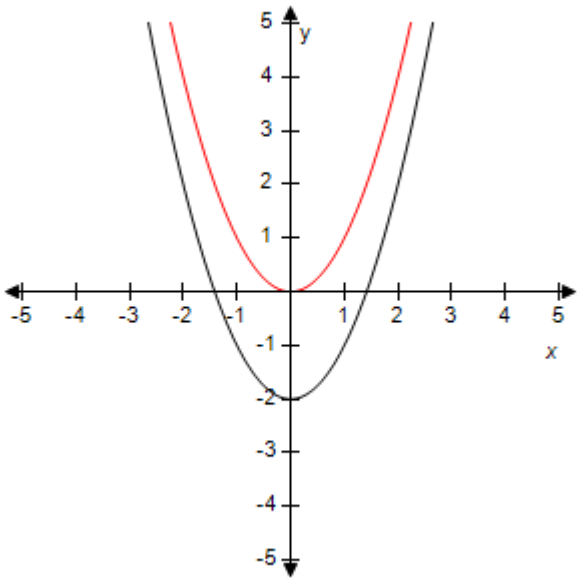
ANSWER: b
POINTS: 1
REFERENCES: 3.1.13c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:14 AM

3. Select the graph of the function $y = x^2 + 4$. Compare the graph of this function with the graph of $y = x^2$.

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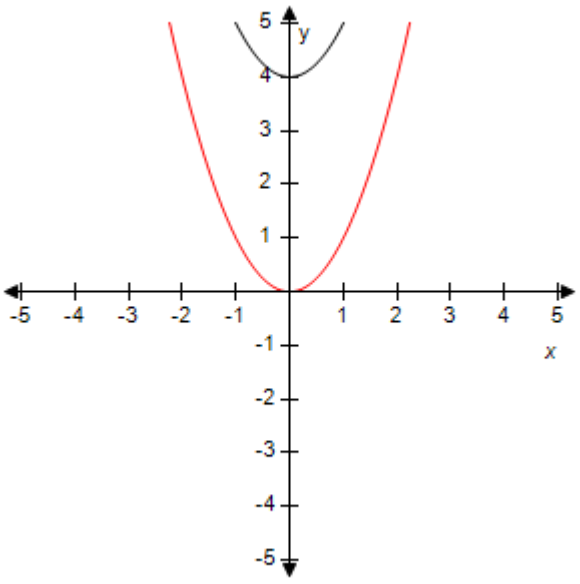
Precalculus Metric Version 11th edition Larson Test Bank

a.



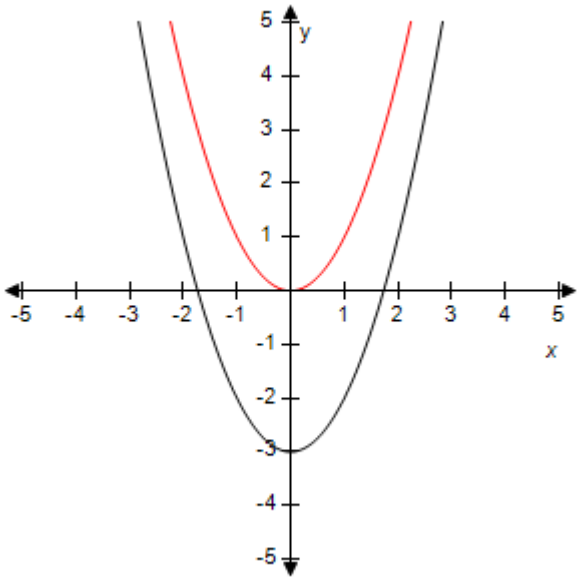
Vertical shift.

b.



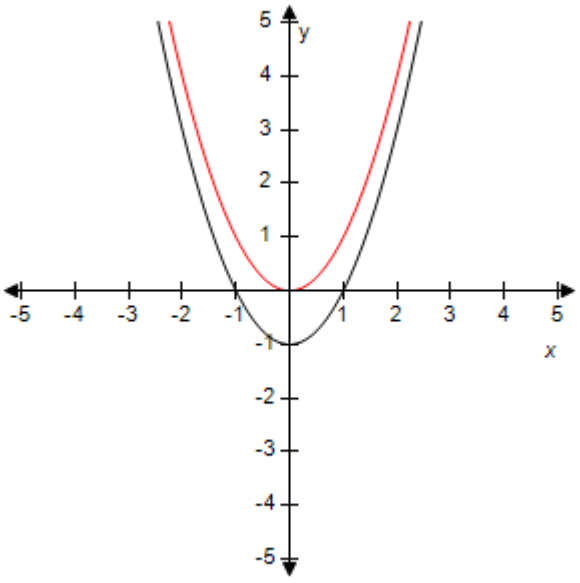
Vertical shift.

c.



Vertical shift.

d.

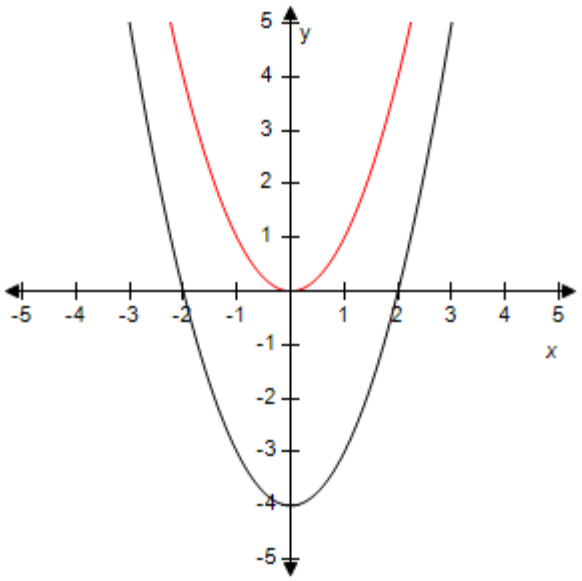


Vertical shift.

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e.



Vertical shift.

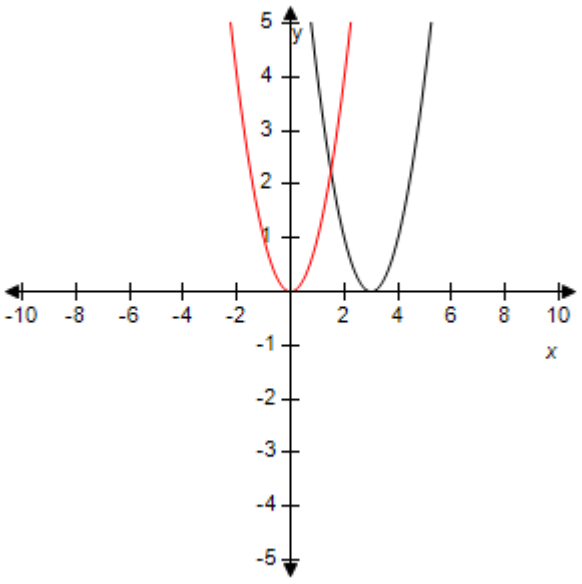
ANSWER: b
POINTS: 1
REFERENCES: 3.1.14a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/23/2014 8:11 AM

4. Select the graph of the function $y = (x-1)^2$. Compare the graph of this function with the graph of $y = x^2$.

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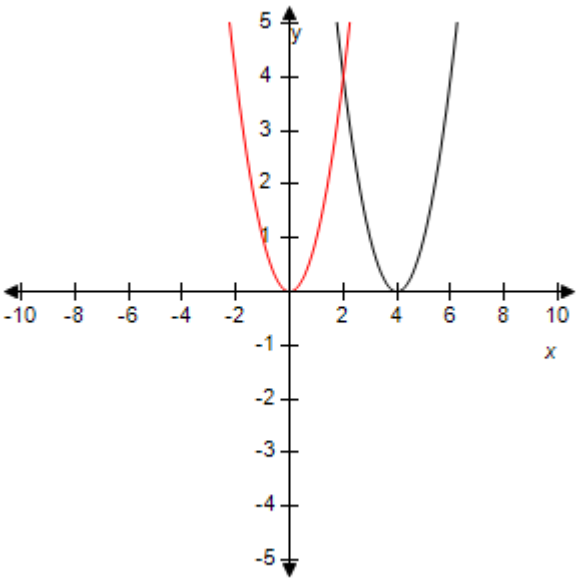
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a.



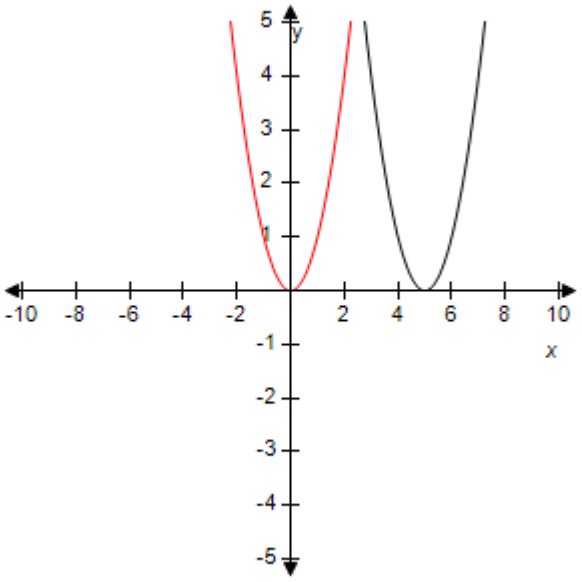
Horizontal shift 3 units to the right.

b.



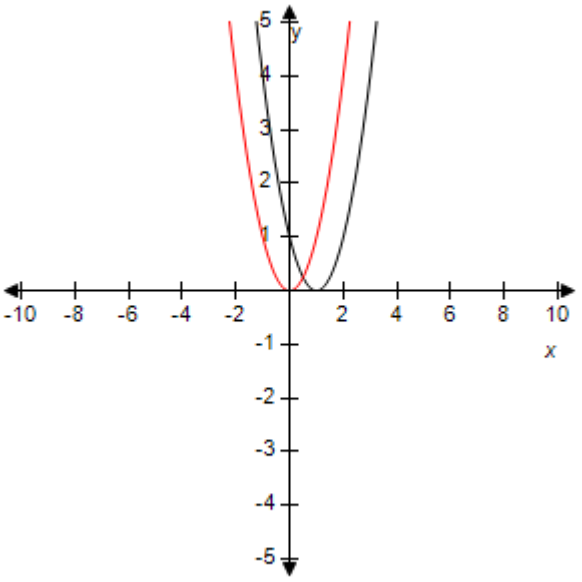
Horizontal shift 4 units to the right.

c.



Horizontal shift 5 units to the right.

d.

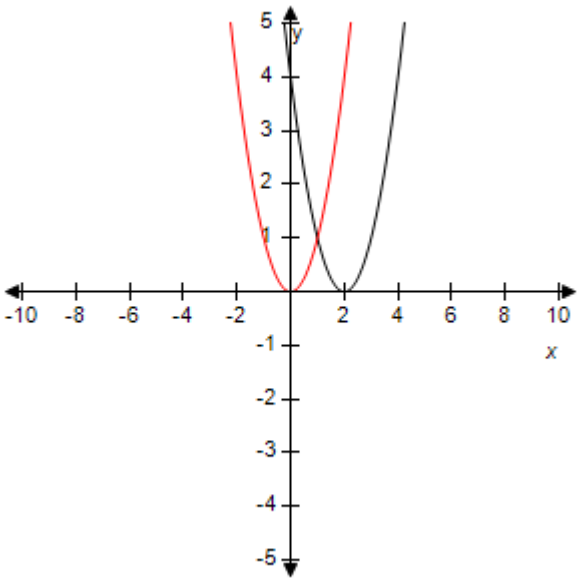


Horizontal shift 1 unit to the right.

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e.



Horizontal shift 2 units to the right.

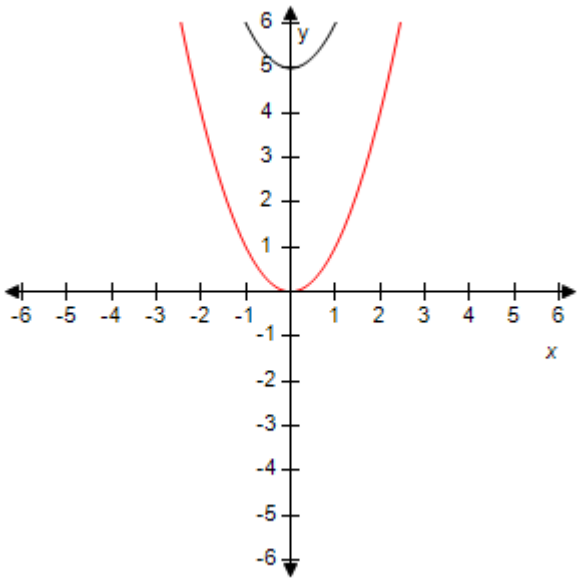
ANSWER: d
POINTS: 1
REFERENCES: 3.1.15a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:19 AM

5. Select the graph of the function $y = x^2 - 1$. Compare the graph of this function with the graph of $y = x^2$.

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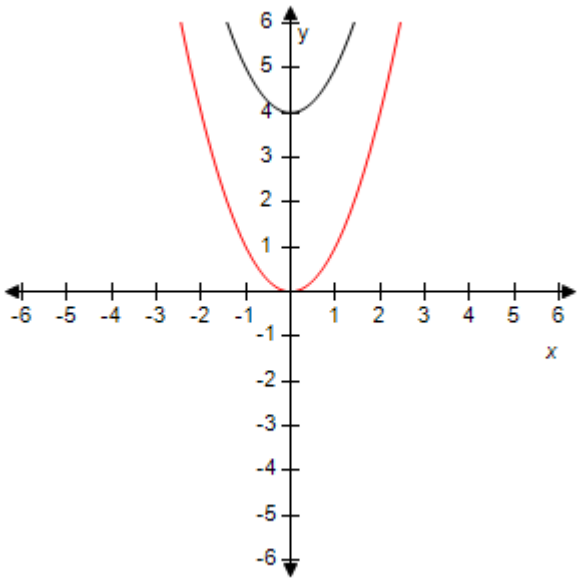
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a.



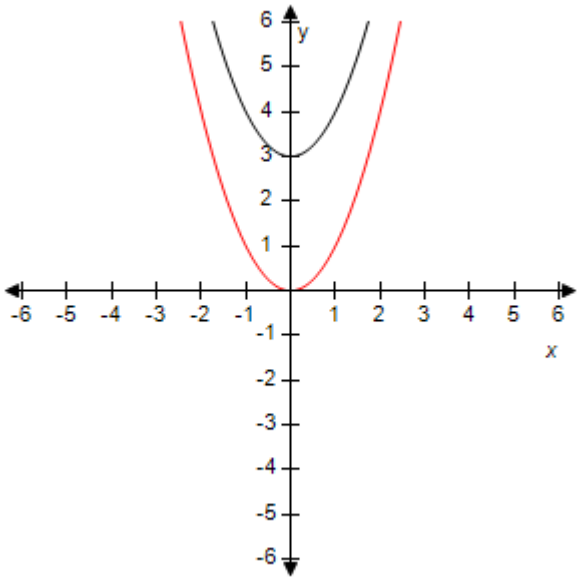
Vertical shift.

b.



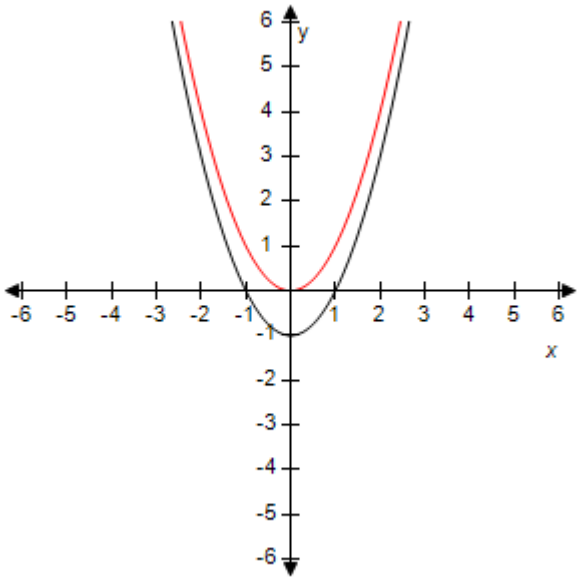
Vertical shift.

c.



Vertical shift.

d.

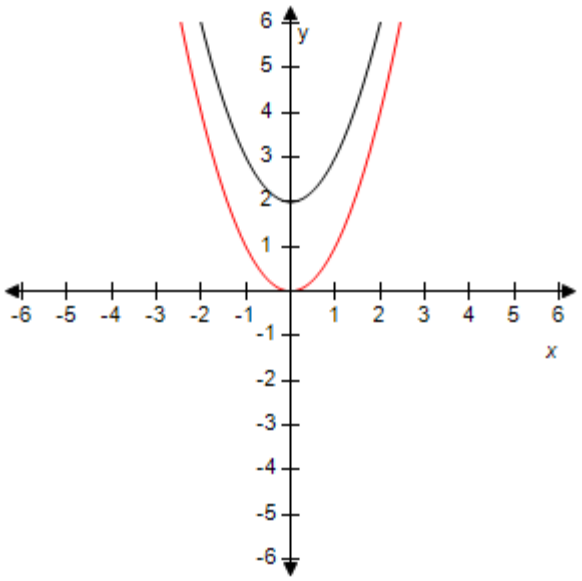


Vertical shift.

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e.



Vertical shift.

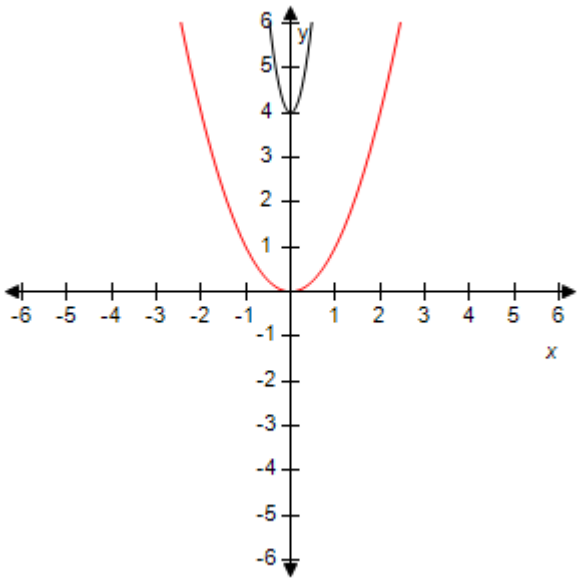
ANSWER: d
POINTS: 1
REFERENCES: 3.1.14b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/23/2014 11:46 PM

6. Select the graph of the function $y = (3x)^2 - 5$. Compare the graph of this function with the graph of $y = x^2$.

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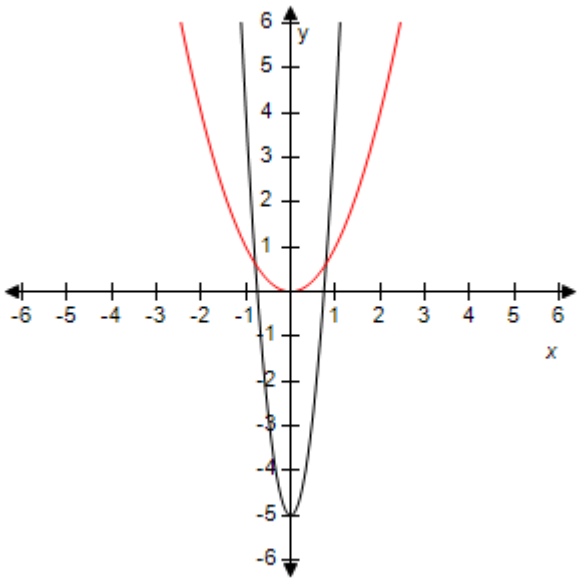
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a.



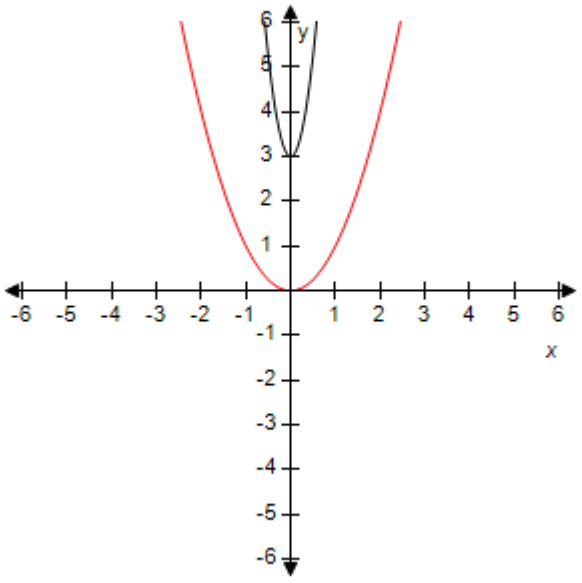
Horizontal shrink and vertical shift.

b.



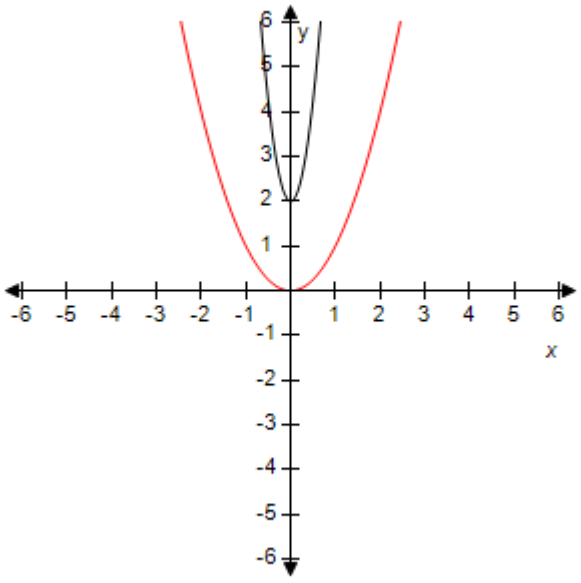
Horizontal shrink and vertical shift.

c.



Horizontal shrink and vertical shift.

d.

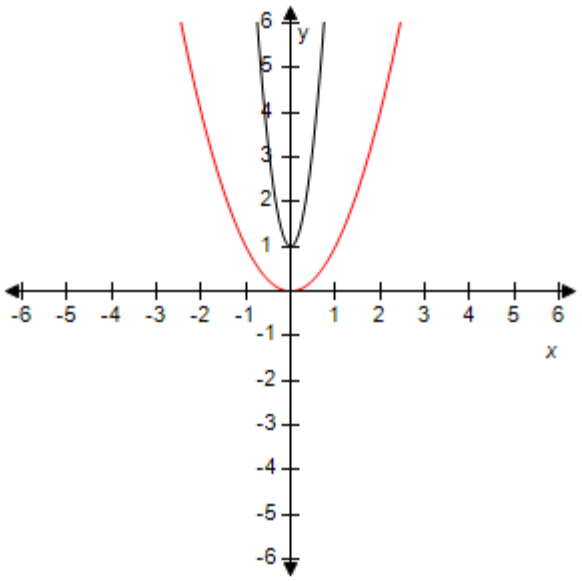


Horizontal shrink and vertical shift.

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e.



Horizontal shrink and vertical shift.

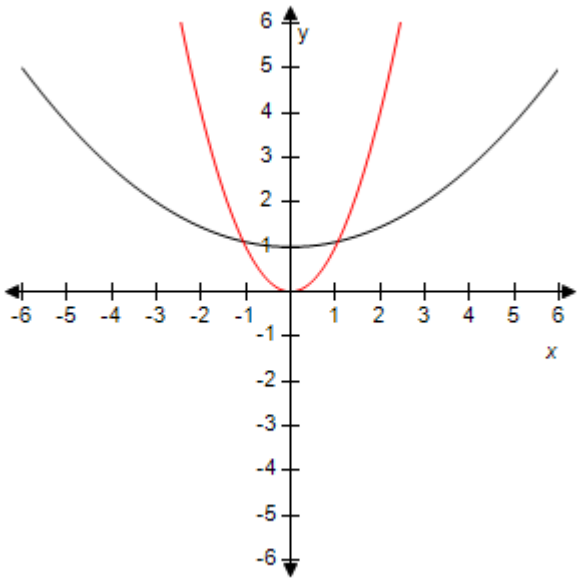
ANSWER: b
POINTS: 1
REFERENCES: 3.1.15b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/23/2014 11:51 PM

7. Select the graph of the function $y = (x/3)^2 - 3$. Compare the graph of this function with the graph of $y = x^2$.

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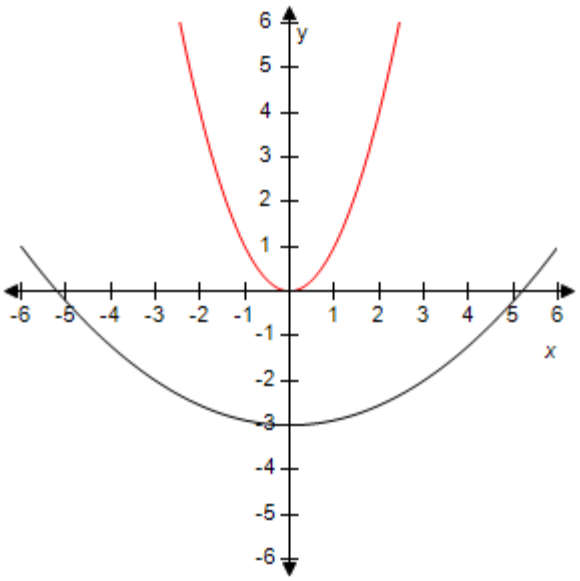
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a.



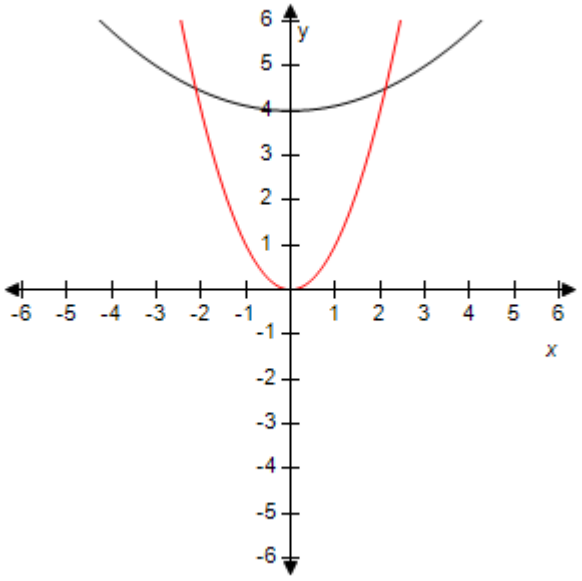
Horizontal stretch and vertical shift.

b.



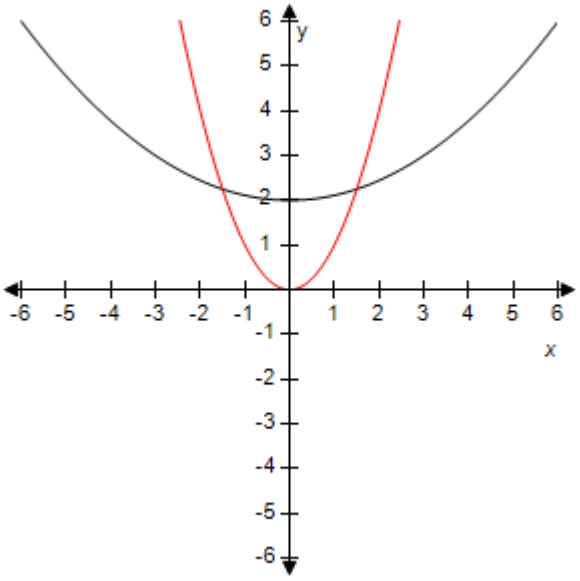
Horizontal stretch and vertical shift.

c.



Horizontal stretch and vertical shift.

d.

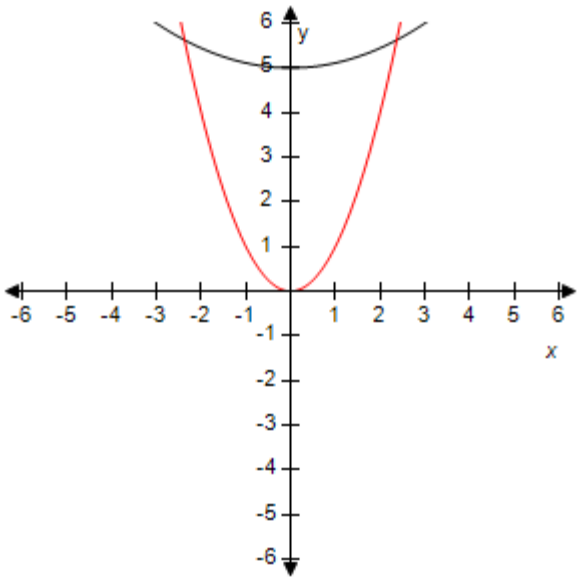


Horizontal stretch and vertical shift.

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e.



Horizontal stretch and vertical shift.

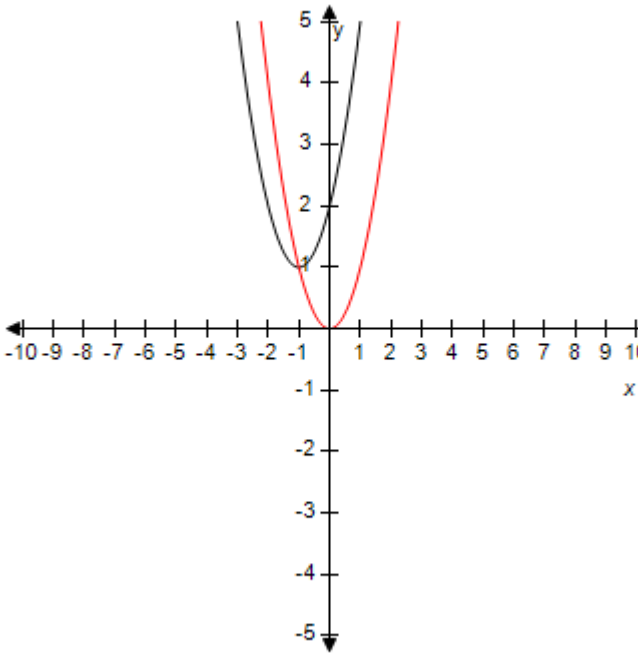
ANSWER: b
POINTS: 1
REFERENCES: 3.1.15c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/23/2014 11:53 PM

8. Select the graph of the function $y = (x-3)^2 + 1$. Compare the graph of this function with the graph of $y = x^2$.

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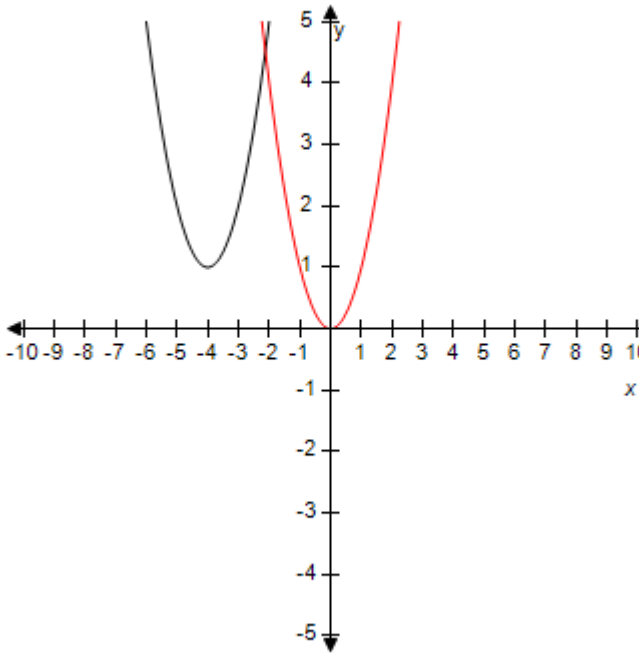
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a.



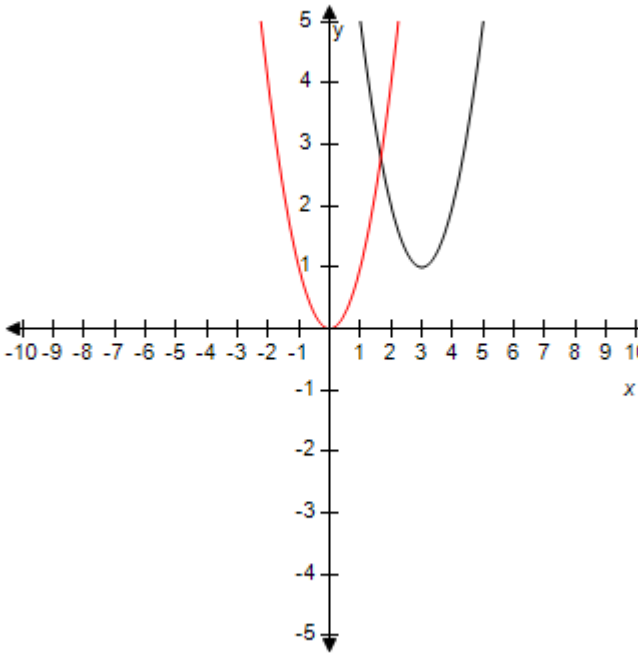
Horizontal shift of 1 unit to the right and vertical shift of 1 unit upward.

b.



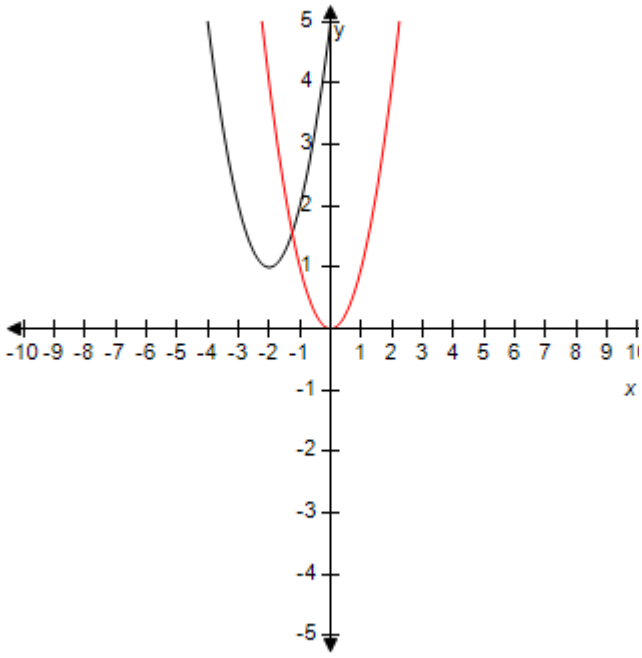
Horizontal shift of 4 units to the right and vertical shift of 1 unit upward.

c.



Horizontal shift of 3 units to the right and vertical shift of 1 unit upward.

d.

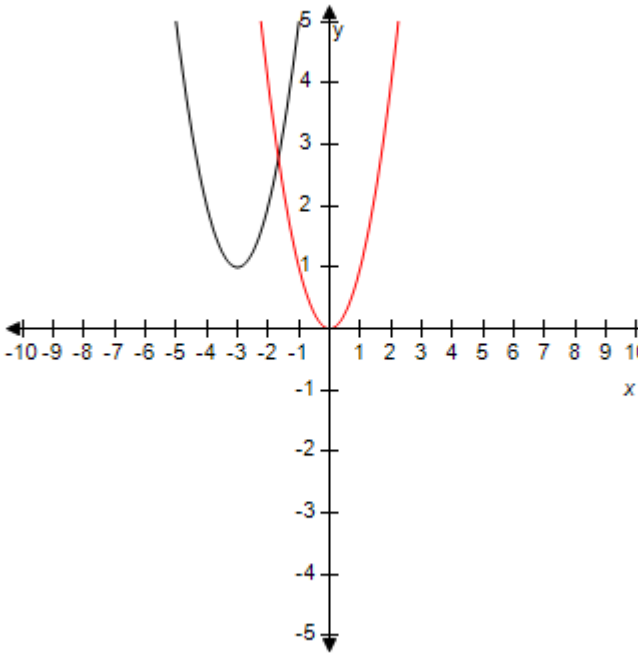


Horizontal shift of 2 units to the right and vertical shift of 1 unit upward.

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e.



Horizontal shift of 3 units to the right and vertical shift of 1 unit upward.

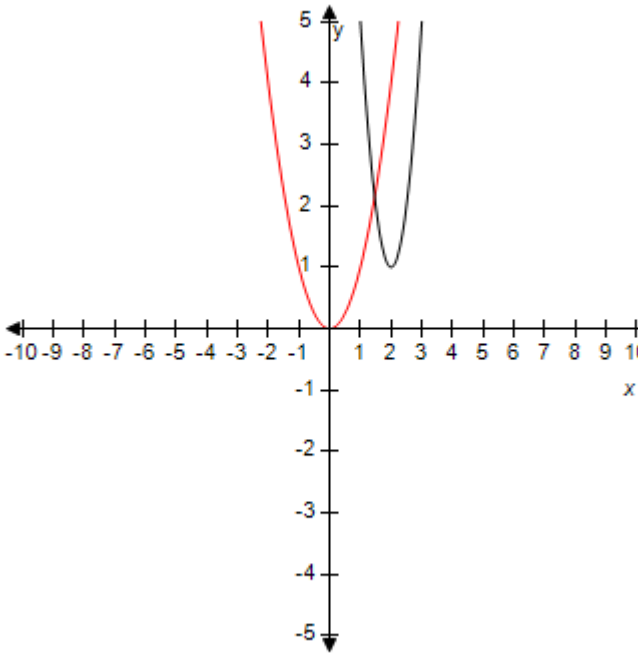
ANSWER: c
POINTS: 1
REFERENCES: 3.1.16a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:52 AM

9. Select the graph of the function $y = [2(x-4)]^2 + 1$. Compare the graph of this function with the graph of $y = x^2$.

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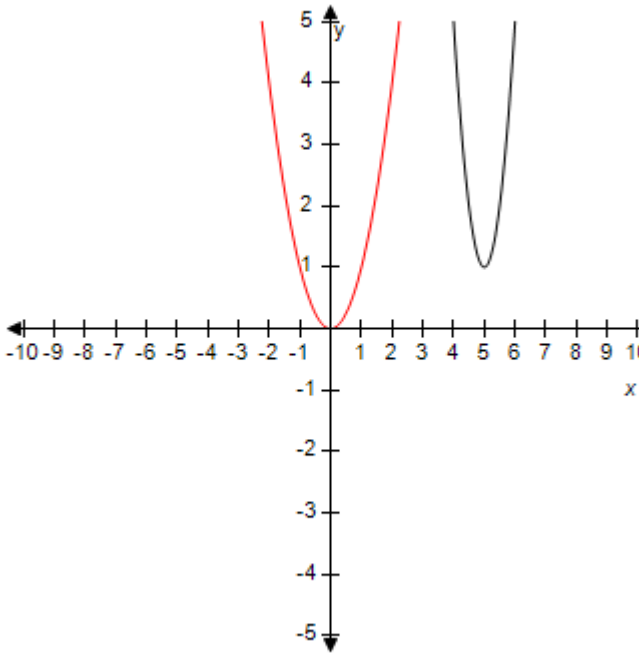
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a.



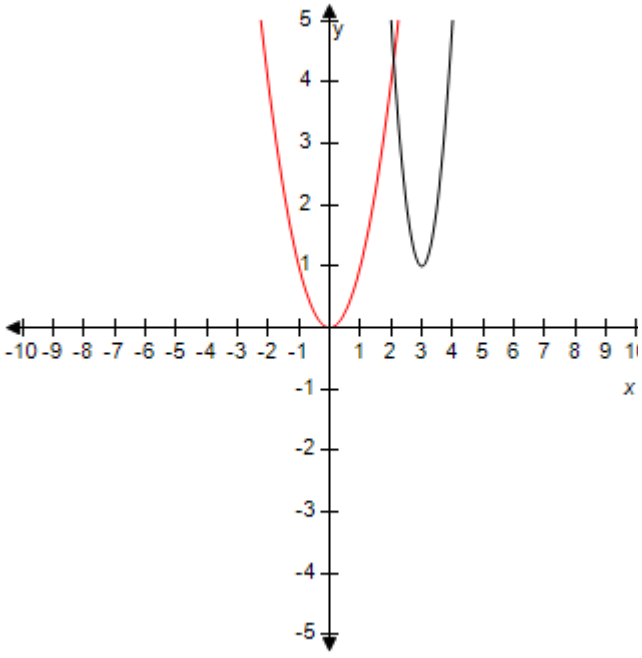
Horizontal shift of 2 units to the right and vertical shift of 1 unit upward and horizontal shrink

b.



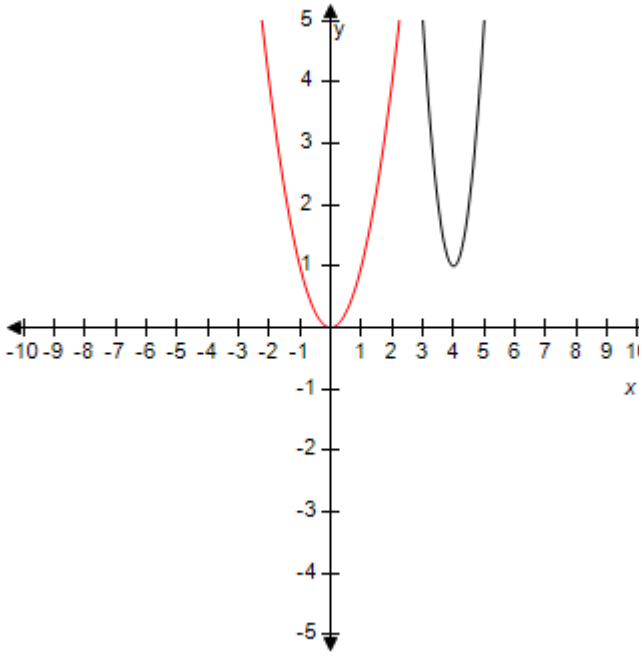
Horizontal shift of 5 units to the right and vertical shift of 1 unit upward and horizontal shrink

c.



Horizontal shift of 3 units to the right and vertical shift of 1 unit upward and horizontal shrink

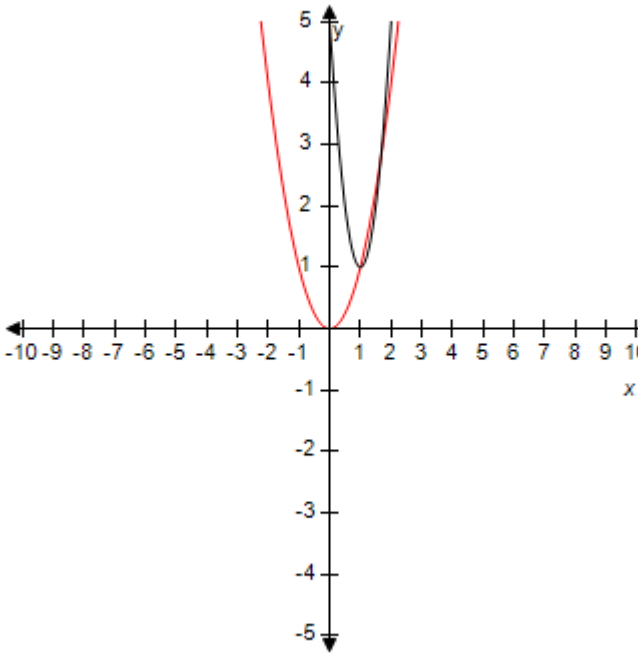
d.



Horizontal shift of 4 units to the right and vertical shift of 1 unit upward and horizontal shrink

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e.



Horizontal shift of 1 unit to the right and vertical shift of 1 unit upward and horizontal shrink

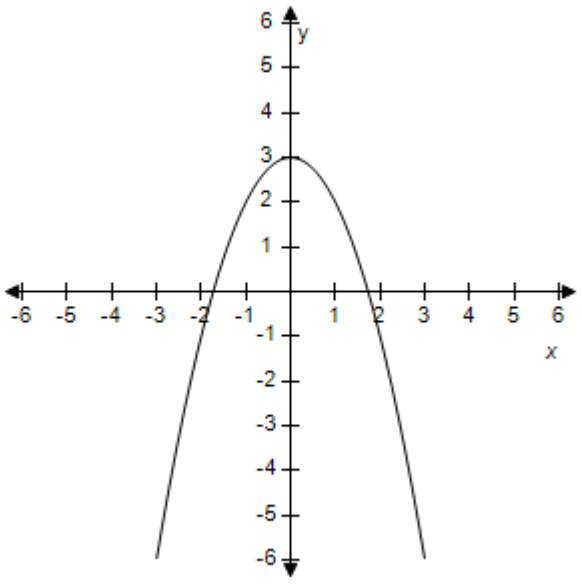
ANSWER: d
POINTS: 1
REFERENCES: 3.1.16d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 5:01 AM

10. Select the graph of the quadratic function $f(x) = 3 - x^2$. Identify the vertex and axis of symmetry.

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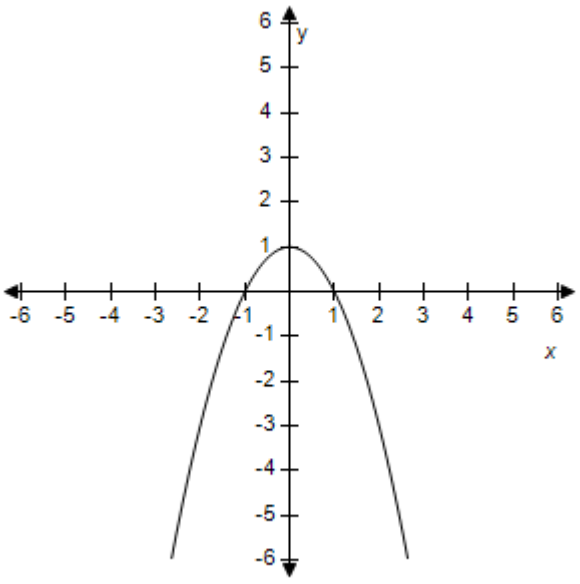
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a.



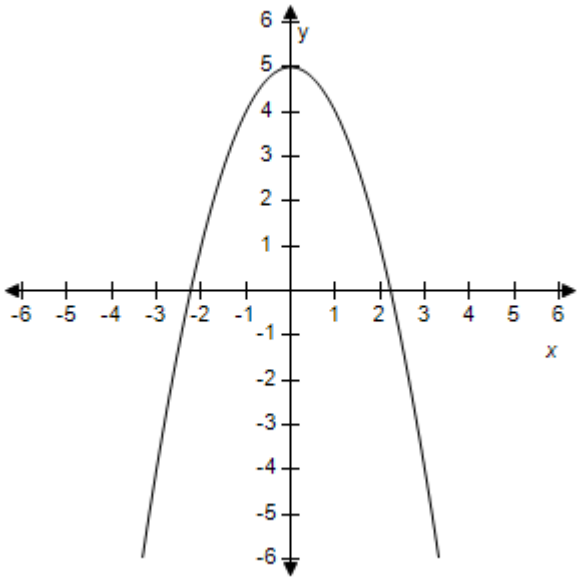
Vertex: (0, 3)
Axis of symmetry: *y*-axis

b.



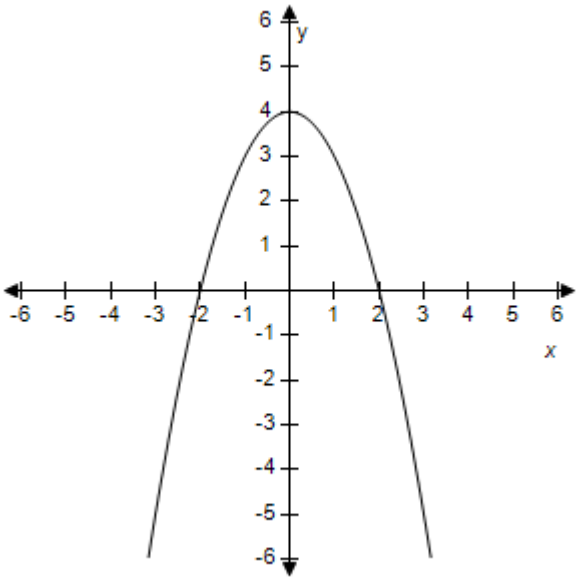
Vertex: (0, 1)
Axis of symmetry: *y*-axis

c.



Vertex: (0, 5)
Axis of symmetry: *y*-axis

d.

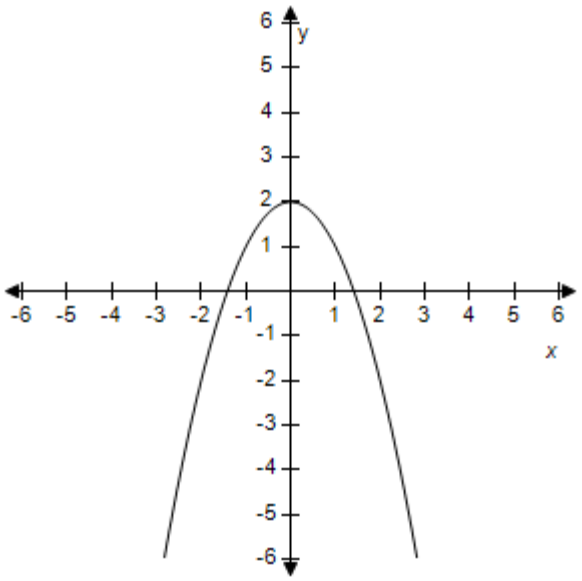


Vertex: (0, 4)
Axis of symmetry: *y*-axis

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e.



Vertex: (0, 2)
Axis of symmetry: *y*-axis

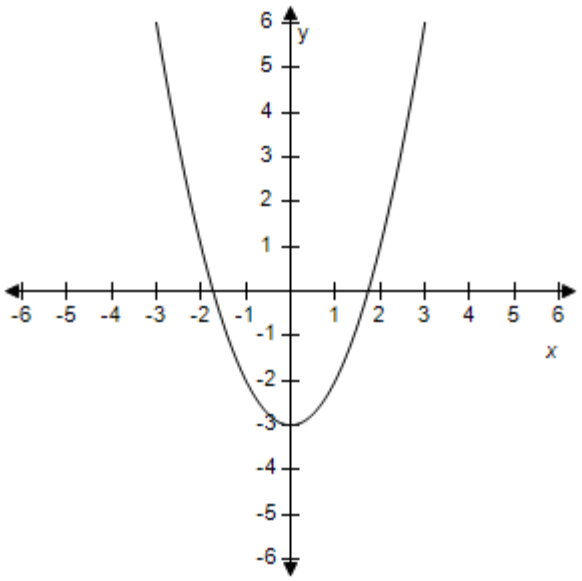
ANSWER: a
POINTS: 1
REFERENCES: 3.1.17
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 12:01 AM

11. Select the graph of the quadratic function $f(x) = x^2 - 3$. Identify the vertex and axis of symmetry.

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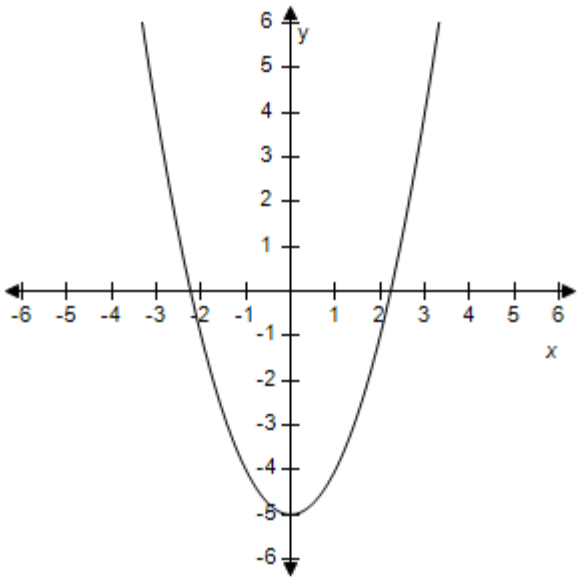
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a.



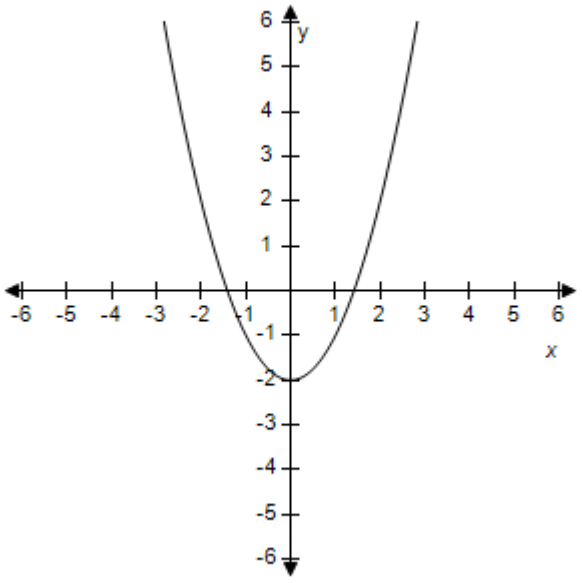
Vertex: (0, –3)
Axis of symmetry: *y*-axis

b.



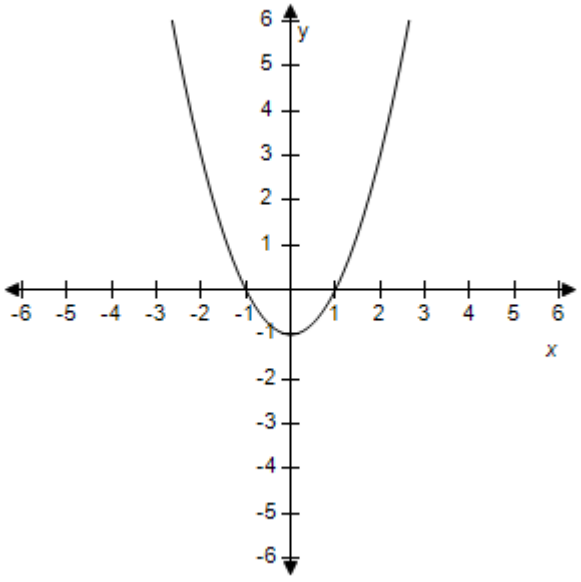
Vertex: (0, –5)
Axis of symmetry: *y*-axis

c.



Vertex: (0, –2)
Axis of symmetry: *y*-axis

d.

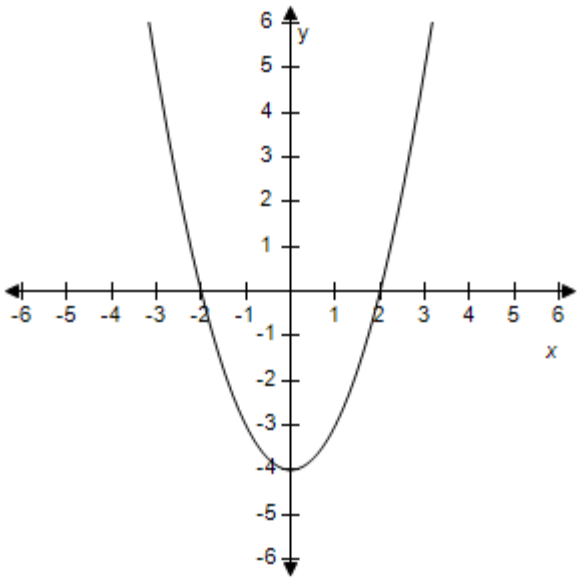


Vertex: (0, –1)
Axis of symmetry: *y*-axis

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e.



Vertex: (0, –4)
Axis of symmetry: *y*-axis

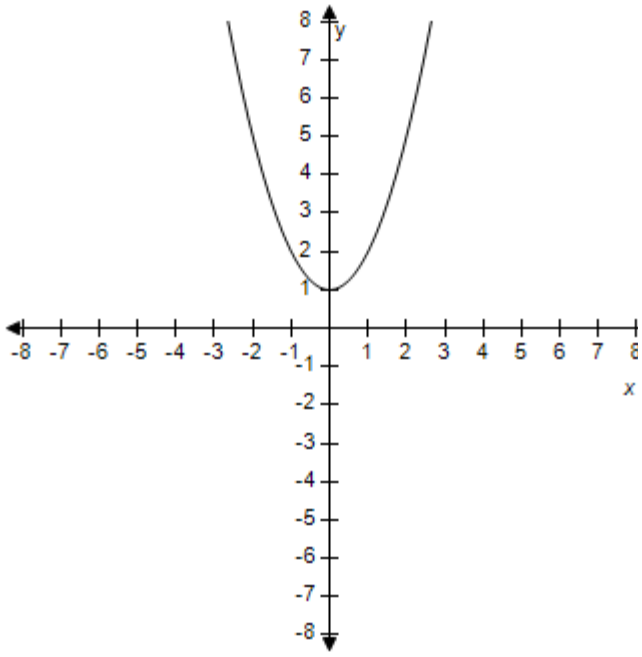
ANSWER: a
POINTS: 1
REFERENCES: 3.1.18
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 12:02 AM

12. Select the graph of the quadratic function $f(x) = x^2 + 5$. Identify the vertex and axis of symmetry.

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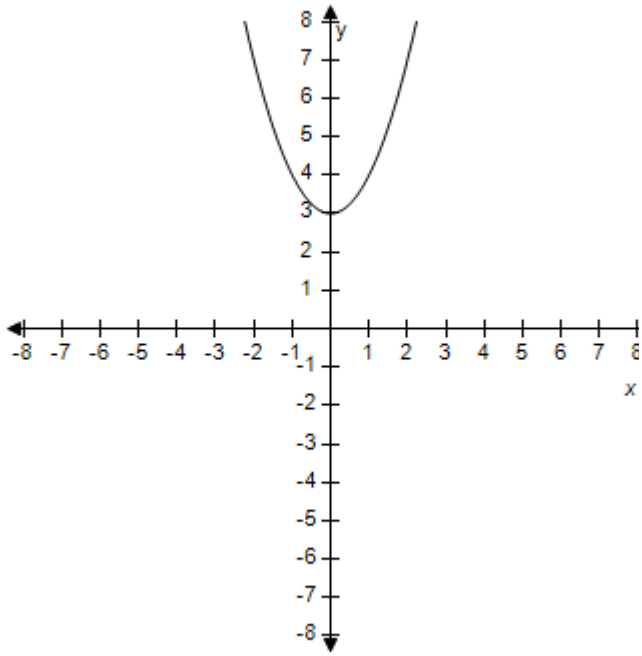
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a.



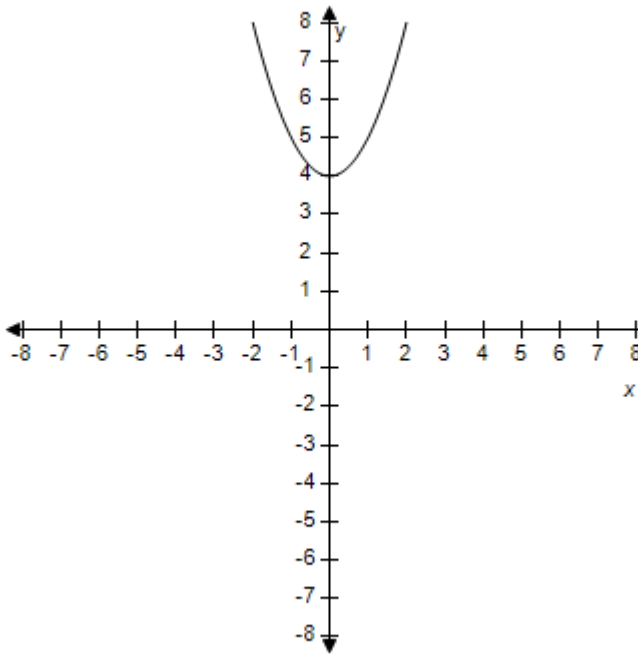
Vertex: (0, 1)
Axis of symmetry: *y*-axis

b.



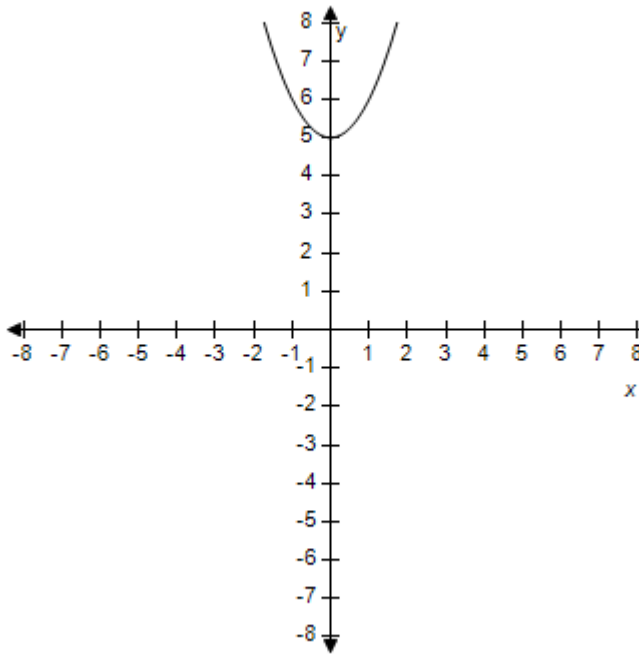
Vertex: (0, 3)
Axis of symmetry: *y*-axis

c.



Vertex: (0, 4)

d.



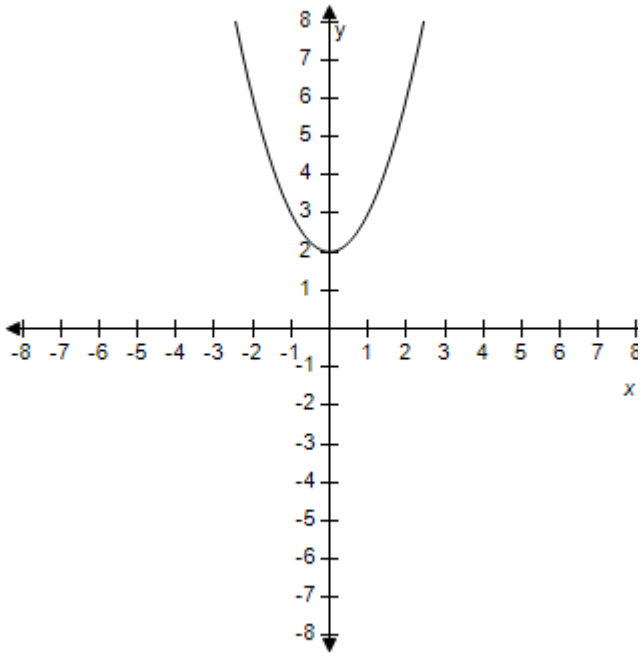
Vertex: (0, 5)
Axis of symmetry: *y*-axis

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Axis of symmetry: y-axis

e.



Vertex: (0, 2)
Axis of symmetry: y-axis

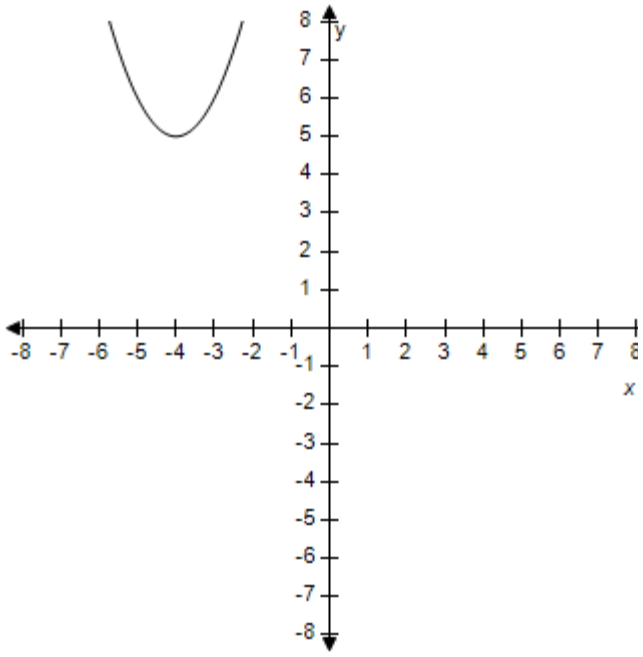
ANSWER: d
POINTS: 1
REFERENCES: 3.1.19
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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13. Select the graph of the quadratic function $f(x) = (x+4)^2 + 3$. Identify the vertex and axis of symmetry.

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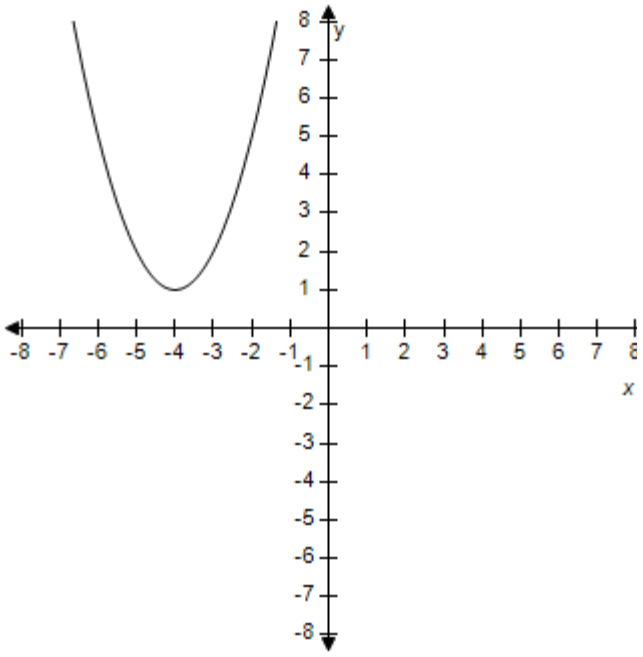
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a.



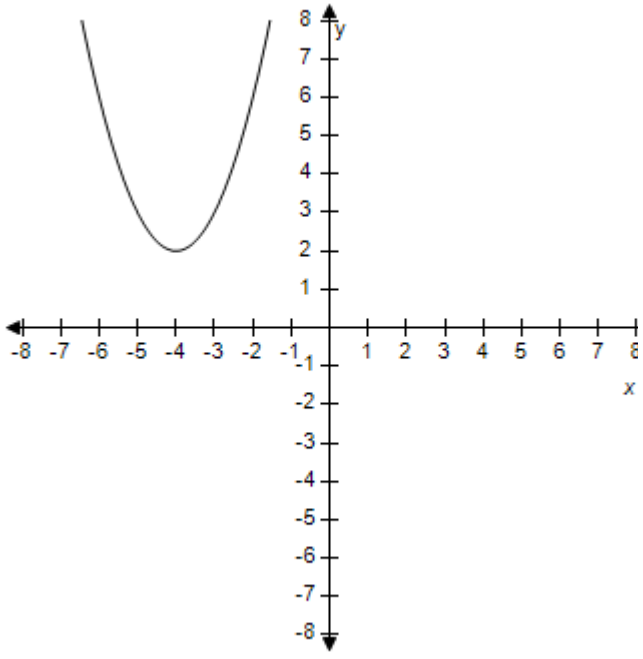
Vertex: (–4, 5)
Axis of symmetry: $x = -4$

b.



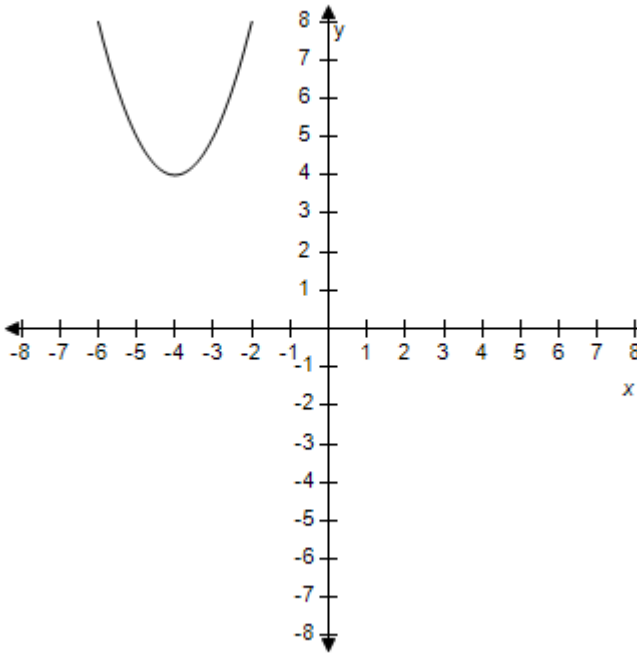
Vertex: (–4, 1)
Axis of symmetry: $x = -4$

c.



Vertex: (–4, 2)

d.



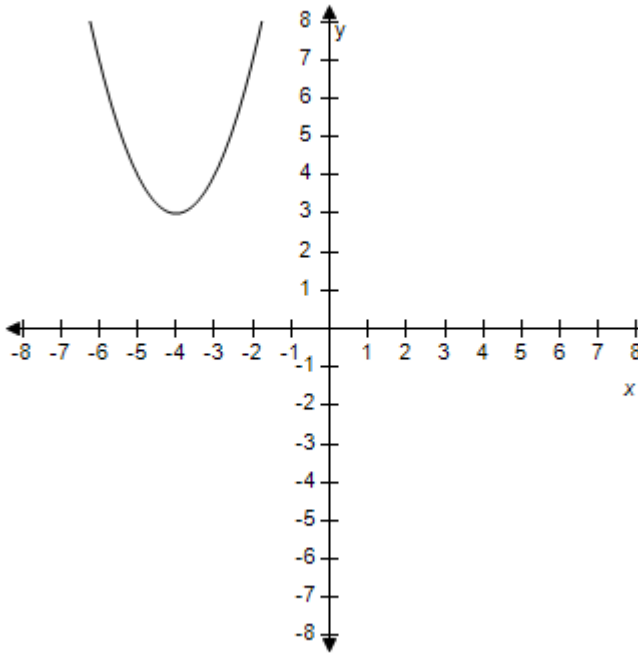
Vertex: (–4, 4)
Axis of symmetry: $x = -4$

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Axis of symmetry: $x = -4$

e.



Vertex: (–4, 3)
Axis of symmetry: $x = -4$

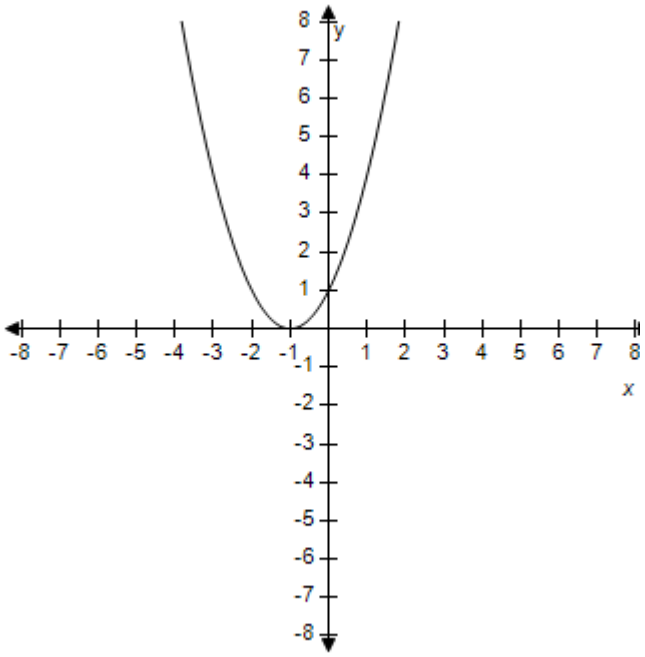
ANSWER: e
POINTS: 1
REFERENCES: 3.1.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/2/2014 3:56 AM

14. Select the graph of the quadratic function $f(x) = x^2 + 2x + 2$. Identify the axis of symmetry.

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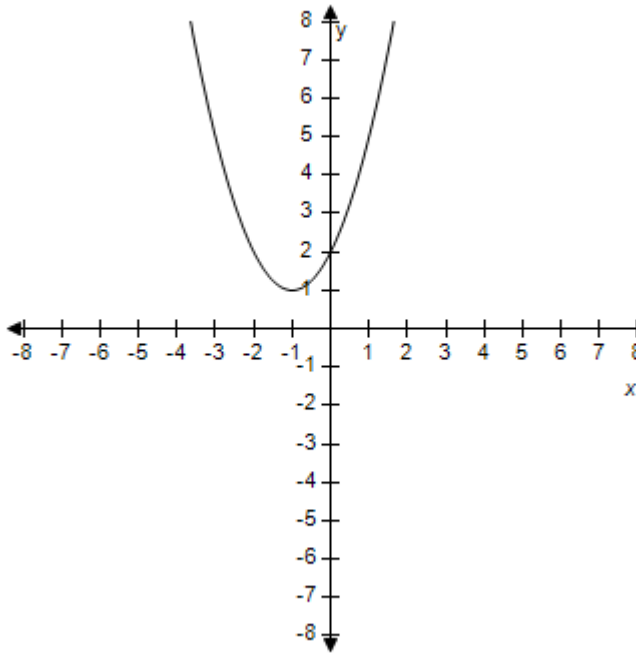
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a.



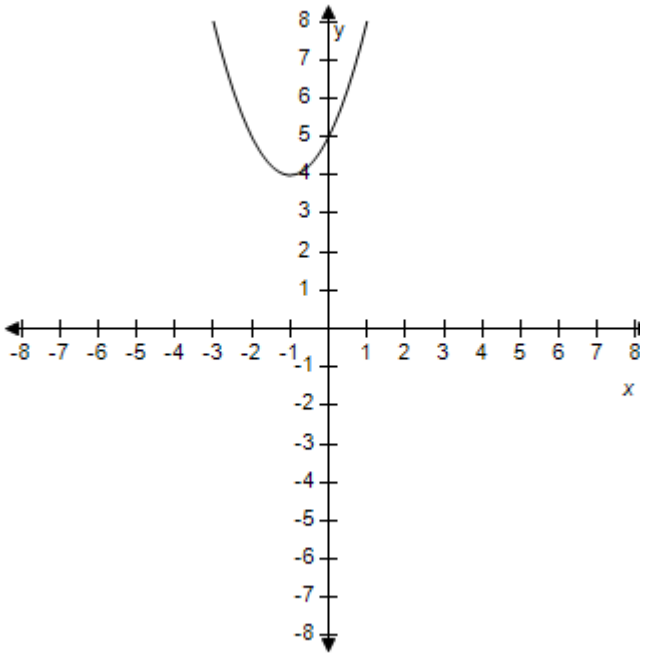
Axis of symmetry: $x = -1$

b.



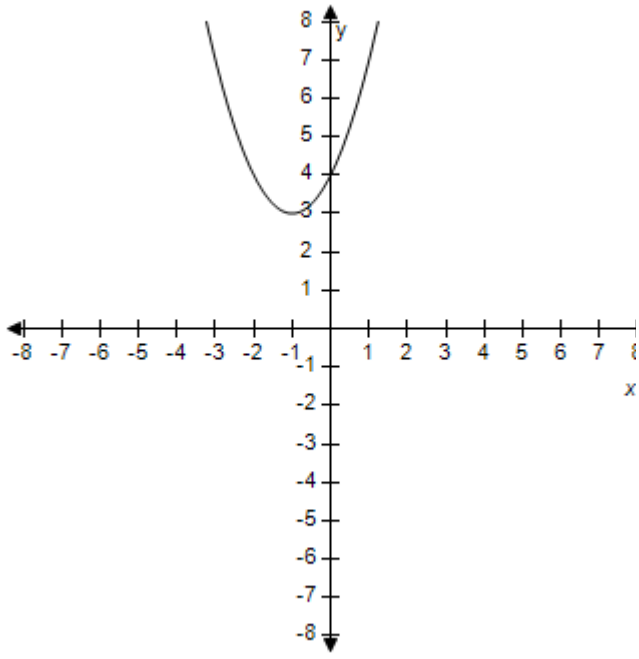
Axis of symmetry: $x = -1$

c.



Axis of symmetry: $x = -1$

d.

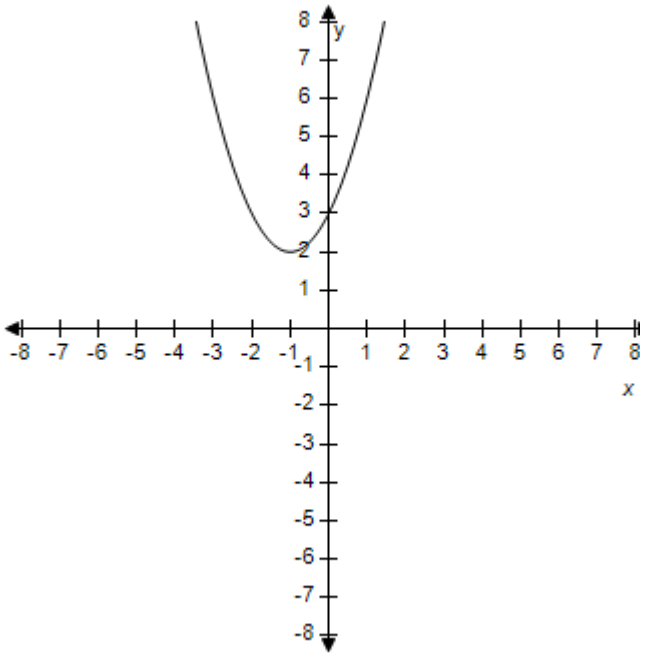


Axis of symmetry: $x = -1$

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e.



Axis of symmetry: $x = -1$

ANSWER:	b
POINTS:	1
REFERENCES:	3.1.26
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:19 PM
DATE MODIFIED:	10/2/2014 11:27 PM

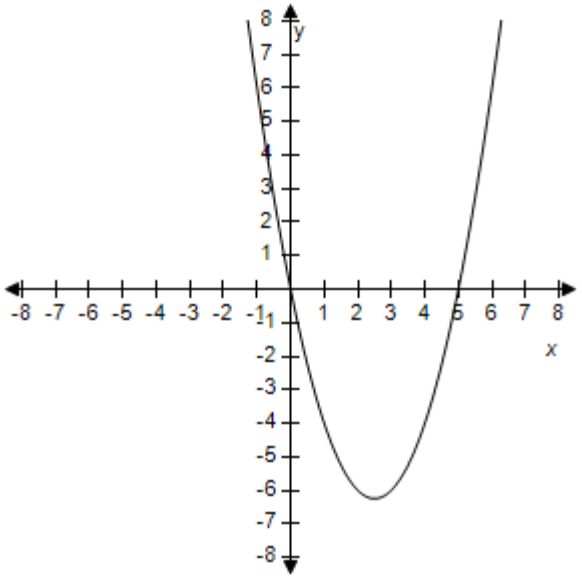
15. Select the graph of the quadratic function.

$f(x) = x^2 - 5x$

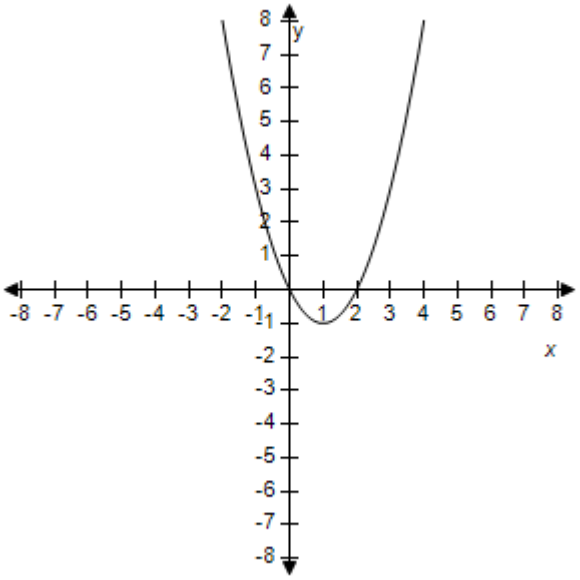
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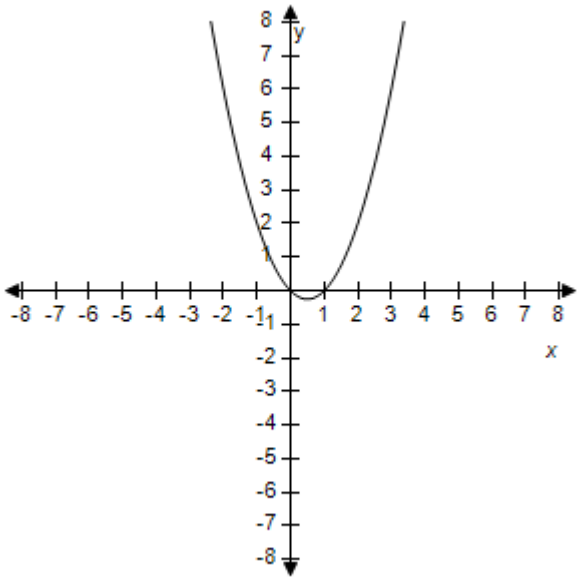
a.



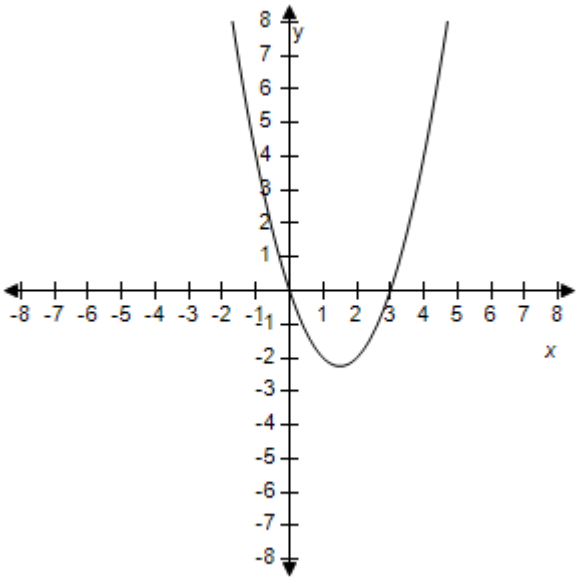
b.



c.



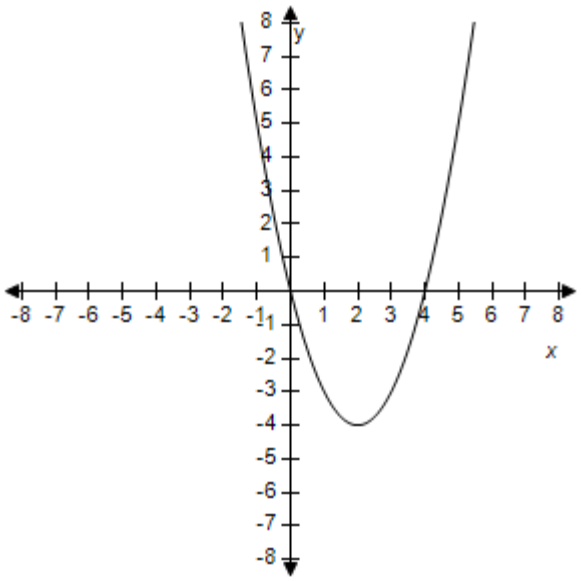
d.



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e.



ANSWER: a
POINTS: 1
REFERENCES: 3.1.59
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 12:06 AM

16. Find two positive real numbers whose product is a maximum. The sum is 140.

a. 90, 50
b. 100, 40
c. 70, 70
d. 80, 60
e. 10, 130

ANSWER: c
POINTS: 1
REFERENCES: 3.1.71
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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17. Find two positive real numbers whose product is a maximum.

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The sum of the first and twice the second is 56.
(Round your answer to two decimal places if necessary.)

a. 28, 5.6
b. 28, 9.33
c. 28, 7
d. 28, 14
e. 14, 14

ANSWER: d
POINTS: 1
REFERENCES: 3.1.73
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 5:15 AM

18. Find two positive real numbers whose product is a maximum.

The sum of the first and three times the second is 48.

a. 24, 8
b. 24, 16
c. 16, 4
d. 24, 6
e. 42, 6

ANSWER: a
POINTS: 1
REFERENCES: 3.1.74
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 2:51 AM

19. The height y (in feet) of a punted football is given by

$$y = -\frac{20}{2025}x^2 + \frac{9}{5}x + 1.6$$

where x is the horizontal distance (in feet) from the point at which the ball is punted.
What is the maximum height of the punt? (Round your answer to two decimal places.)

a. 123.61
b. 113.61
c. 103.61

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d. 83.61
e. 93.61

ANSWER: d
POINTS: 1
REFERENCES: 3.1.76b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 4:15 AM

20. A manufacturer of lighting fixtures has daily production costs of $C = 800 - 80x + 0.25x^2$ where C is the total cost (in dollars) and x is the number of units produced. How many fixtures should be produced each day to yield a minimum cost?
(Round your answer to two decimal places.)

a. 160
b. 106.67
c. 320
d. 400
e. 800

ANSWER: a
POINTS: 1
REFERENCES: 3.1.77
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 12:24 AM

21. The profit P (in hundreds of dollars) that a company makes depends on the amount x (in hundreds of dollars) the company spends on advertising according to the model

$P = 230 + 30x - 0.5x^2$

What expenditure for advertising will yield a maximum profit?

a. 30
b. 0.5
c. 230
d. 15
e. 115

ANSWER: a

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POINTS: 1
REFERENCES: 3.1.78
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 5:21 AM

22. The total revenue R earned (in thousands of dollars) from manufacturing handheld video games is given by

$$R(p) = -25p^2 + 1200p$$

where p is the price per unit (in dollars).

Find the revenue when the price per unit is $20.

a. $14,000,300
b. $14,000,200
c. $14,000,400
d. $14,000,000
e. $14,000,100

ANSWER: d
POINTS: 1
REFERENCES: 3.1.79a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 4:54 AM

23. The total revenue R earned (in thousands of dollars) from manufacturing handheld video games is given by

$$R(p) = -25p^2 + 1900p$$

where p is the price per unit (in dollars).

Find the unit price that will yield a maximum revenue.

a. $42.00
b. $40.00
c. $41.00
d. $39.00
e. $38.00

ANSWER: e
POINTS: 1
REFERENCES: 3.1.79b

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Section 2.1 - Quadratic Functions and Models

QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 5:25 AM

24. The total revenue R earned per day (in dollars) from a pet-sitting service is given by

$$R(p) = -12p^2 + 150p$$

where p is the price charged per pet (in dollars).

Find the revenue when the price per pet is $3.

a. $372.00
b. $352.00
c. $382.00
d. $362.00
e. $342.00

ANSWER: e
POINTS: 1
REFERENCES: 3.1.80a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 5:03 AM

25. The total revenue R earned per day (in dollars) from a pet-sitting service is given by

$$R(p) = -10p^2 + 120p$$

where p is the price charged per pet (in dollars).

Find the price that will yield a maximum revenue.

a. $7.00
b. $10.00
c. $8.00
d. $6.00
e. $9.00

ANSWER: d
POINTS: 1
REFERENCES: 3.1.80b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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Section 2.1 - Quadratic Functions and Models

STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 5:06 AM

26. A small theater has a seating capacity of 2000. When the ticket price is $20, attendance is 1500. For each $1 decrease in price, attendance increases by 125. Write the revenue R of the theater as a function of ticket price x.

a. $R(x) = 125x^2 + 3000x, \ 16 \le x \le 20$

b. $R(x) = -125x^2 + 1000x, \ 16 \le x \le 20$

c. $R(x) = -125x^3 + 500x, \ 16 \le x \le 20$

d. $R(x) = -125x^2 - 350x, \ 16 \le x \le 20$

e. $R(x) = -125x^2 + 4000x, \ 16 \le x \le 20$

ANSWER: e
POINTS: 1
REFERENCES: 3.1.83a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 6:15 AM

27. A small theater has a seating capacity of 2000. When the ticket price is $20, attendance is 1500. For each $1 decrease in price, attendance increases by 100. The revenue R of the theater as a function of ticket price x is as follows

$R(x) = -100x^2 + 3500x, \ 15 \le x \le 20$

What ticket price will yield a maximum revenue?

a. $47.50

b. $27.50

c. $17.50

d. $37.50

e. $57.50

ANSWER: c
POINTS: 1
REFERENCES: 3.1.83b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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28. Determine whether the statement is true or false.

The function given by $f(x) = -16x^2 - 7$ has no x-intercepts.

a. True
b. False

ANSWER: a
POINTS: 1
REFERENCES: 3.1.87
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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29. Find the values of b such that the function $f(x) = -x^2 + bx - 75$ has the given maximum value 94.

a. ±32
b. ±28
c. ±26
d. ±30
e. ±34

ANSWER: c
POINTS: 1
REFERENCES: 3.1.91
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 3:18 PM

30. Find the values of b such that the function $f(x) = x^2 + bx + 59$ has the given minimum value 10.

a. ±18
b. ±22
c. ±14
d. ±20
e. ±16

ANSWER: c
POINTS: 1

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REFERENCES: 3.1.93
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/17/2021 3:19 PM

31. Find the values of b such that the function $f(x)=x^2+bx-25$ has the given minimum value –74.

a. ±16
b. ±22
c. ±14
d. ±18
e. ±20

ANSWER: c
POINTS: 1
REFERENCES: 3.1.94
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 5:36 AM

32. Find the values of b such that the function $f(x)=-x^2+bx-16$ has the given maximum value 65.

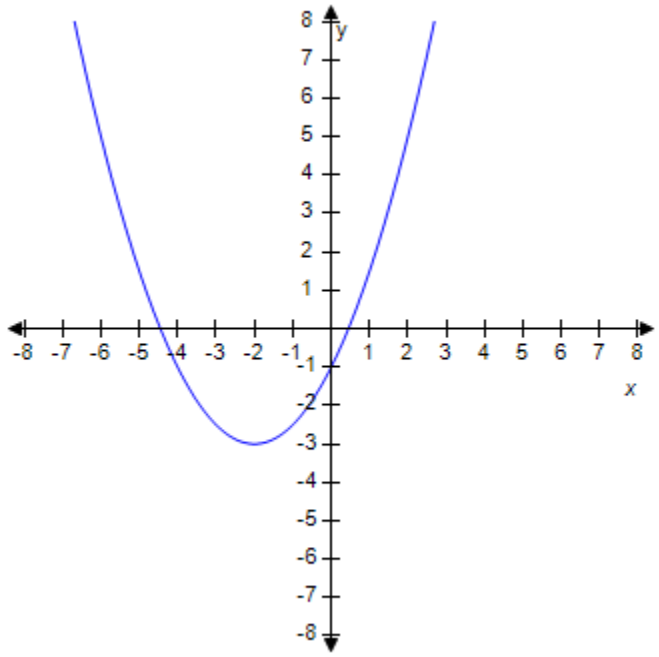
a. ±18
b. ±22
c. ±24
d. ±20
e. ±26

ANSWER: a
POINTS: 1
REFERENCES: 3.1.92
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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33. Find the standard form of the quadratic function shown below:

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a. $f(x) = (x+2)^2 - 3$

b. $f(x) = \frac{1}{2}(x-2)^2 + 3$

c. $f(x) = -\frac{2}{3}(x-1)^2 + 3$

d. $f(x) = \frac{1}{2}(x+2)^2 - 3$

e. $f(x) = \frac{1}{4}(x-2)^2 + 3$

ANSWER: d
POINTS: 1
REFERENCES: 3.1.7
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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34. Compare the graph of $t(x) = 5(x-9)^2 + 4$ with $t(x) = x^2$.

a. $t(x) = x^2$ shifts left 9 units, shifts downward 4 units, and stretches by a factor of 5.

b. $t(x) = x^2$ shifts left 9 units, shifts upward 4 units, and stretches by a factor of 5.

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c. $t(x) = x^2$ shifts right 9 units, shifts downward 4 units, and shrinks by a factor of $\frac{1}{5}$.

d. $t(x) = x^2$ shifts right 9 units, shifts upward 4 units, and shrinks by a factor of $\frac{1}{5}$.

e. $t(x) = x^2$ shifts right 9 units, shifts upward 4 units, and stretches by a factor of 5.

ANSWER: e
POINTS: 1
REFERENCES: 3.1.15a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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35. Compare the graph of $t(x) = \left[-\frac{1}{7}(x + 8)\right]^2 - 4$ with $t(x) = x^2$.

a. $t(x) = x^2$ shifts left 8 units, shifts downward 4 units, and shrinks by a factor of $\frac{1}{49}$.

b. $t(x) = x^2$ shifts right 8 units, shifts upward 4 units, and shrinks by a factor of $\frac{1}{49}$.

c. $t(x) = x^2$ shifts left 64 units, shifts upward 4 units, and shrinks by a factor of $-\frac{1}{7}$.

d. $t(x) = x^2$ shifts right 64 units, shifts upward 4 units, and shrinks by a factor of $\frac{1}{49}$.

e. $t(x) = x^2$ shifts right 8 units, shifts downward 4 units, and shrinks by a factor of $-\frac{1}{49}$.

ANSWER: a
POINTS: 1
REFERENCES: 3.1.16c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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36. From the graph of the quadratic function $f(x) = (x + 6)^2 - 1$, determine the equation of the axis of symmetry.

a. $x = -6$
b. $x = -1$

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c. $x = -\frac{1}{6}$

d. $x = 1$

e. $x = 6$

ANSWER: a
POINTS: 1
REFERENCES: 3.1.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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37. Determine the x-intercept(s) of the quadratic function $f(x) = x^2 + 2x + 2$.

a. $(0, 0), (-5, 0)$

b. $(-7, 0), (-4, 0)$

c. no x-intercept(s)

d. $(-7, 0), (-5, 0)$

e. $(-2, 0), (2, 0)$

ANSWER: c
POINTS: 1
REFERENCES: 3.1.26
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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38. Determine the x-intercept(s) of the quadratic function $f(x) = x^2 + 8x + 12$.

a. $(2, 0), (6, 0)$

b. $(6, 0), (5, 0)$

c. $(-2, 0), (-6, 0)$

d. $(-6, 0), (-5, 0)$

e. no x-intercept(s)

ANSWER: c
POINTS: 1
REFERENCES: 3.1.25
QUESTION TYPE: Multi-Mode (Multiple choice)

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Section 2.1 - Quadratic Functions and Models

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STUDENT ENTRY MODE: Basic
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39. Determine the vertex of the graph of the quadratic function $f(x) = x^2 + 5x + \frac{29}{4}$.

a. $\left(\frac{5}{2}, \frac{29}{4}\right)$ b. $\left(\frac{5}{4}, \frac{21}{4}\right)$

c. $\left(-\frac{5}{2}, 1\right)$ d. $\left(-\frac{5}{2}, \frac{27}{2}\right)$

e. $\left(5, \frac{29}{4}\right)$

ANSWER: c
POINTS: 1
REFERENCES: 3.1.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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40. From the graph of the quadratic function $f(x) = -x^2 + 12x + 4$, determine the equation of the axis of symmetry.

a. $x = 6$
b. $x = 4$
c. $x = 40$
d. $x = -12$
e. $x = -32$

ANSWER: a
POINTS: 1
REFERENCES: 3.1.30
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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41. Write the quadratic function $f(x) = x^2 + 2x + 5$ in standard form.

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a. $f(x) = -(x+1)^2 - 4$

b. $f(x) = (x-4)^2 - 1$

c. $f(x) = -(x-1)^2 - 4$

d. $f(x) = (x+1)^2 + 4$

e. $f(x) = -(x-4)^2 + 1$

ANSWER: d
POINTS: 1
REFERENCES: 3.1.36
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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42. Write the quadratic function $f(x) = -x^2 + 8x - 8$ in standard form.

a. $f(x) = (x-8)^2 - 4$

b. $f(x) = (x-4)^2 - 8$

c. $f(x) = -(x+4)^2 + 8$

d. $f(x) = -(x+8)^2 - 4$

e. $f(x) = -(x-4)^2 + 8$

ANSWER: e
POINTS: 1
REFERENCES: 3.1.40
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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43. Write the quadratic function $f(x) = \frac{1}{4}(x^2 + 8x - 20)$ in standard form.

a. $f(x) = \frac{1}{4}(x+4)^2 - 9$

b. $f(x) = \frac{1}{4}(x-9)^2 + 4$

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c. $f(x) = \frac{1}{4}(x - 4)^2 + 9$

d. $f(x) = -\frac{1}{9}(x + 4)^2 - 9$

e. $f(x) = -\frac{1}{9}(x - 4)^2 - 9$

ANSWER: a
POINTS: 1
REFERENCES: 3.1.41
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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44. Write the standard form of the equation of the parabola that has a vertex at (–6, –5) and passes through the point (–8, 6).

a. $f(x) = \frac{11}{36}(x - 6)^2 - 5$

b. $f(x) = -\frac{5}{36}(x + 5)^2 + 8$

c. $f(x) = \frac{11}{4}(x + 6)^2 - 5$

d. $f(x) = \frac{3}{2}(x + 6)^2 - 8$

e. $f(x) = \frac{5}{8}(x + 5)^2 + 6$

ANSWER: c
POINTS: 1
REFERENCES: 3.1.47
QUESTION TYPE: Multiple Choice
HAS VARIABLES: True
DATE CREATED: 10/3/2014 1:41 AM
DATE MODIFIED: 10/3/2014 2:27 AM

45. Write the standard form of the equation of the parabola that has a vertex at $\left(-\frac{2}{3}, \frac{1}{9}\right)$ and passes through the point $(2, 3)$.

a. $f(x) = \frac{13}{32}\left(x - \frac{3}{2}\right)^2 + \frac{1}{9}$

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b. $f(x)=\frac{13}{32}\left(x+\frac{2}{3}\right)^2+\frac{1}{9}$

c. $f(x)=\frac{13}{4}\left(x-\frac{2}{3}\right)^2-\frac{1}{9}$

d. $f(x)=\frac{13}{8}\left(x-\frac{3}{2}\right)^2-\frac{1}{9}$

e. $f(x)=\frac{13}{4}\left(x+\frac{2}{3}\right)^2+\frac{1}{9}$

ANSWER: b
POINTS: 1
REFERENCES: 3.1.53
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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46. Find two positive real numbers whose product is a maximum and whose sum is 160.

a. 89, 71
b. 85, 75
c. 80, 80
d. 78, 82
e. 92, 68

ANSWER: c
POINTS: 1
REFERENCES: 3.1.71
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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47. Find two positive real numbers whose product is a maximum and whose sum of the first number and four times the second is 160.

a. 128, 8
b. 88, 18
c. 80, 20
d. 96, 16
e. 56, 26

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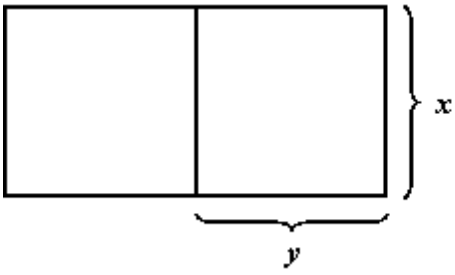
ANSWER: c
POINTS: 1
REFERENCES: 3.1.74
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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48. The height, $h(x)$, of a punted rugby ball is given by $h(x) = -\frac{1}{64}x^2 + \frac{21}{32}x + 3$ where x is the horizontal distance in feet from the point where the ball is punted. How far, horizontally, is the ball from the kicker when it is at its highest point?

a. 45 feet
b. 21 feet
c. 26 feet
d. 31 feet
e. 24 feet

ANSWER: b
POINTS: 1
REFERENCES: 3.1.76
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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49. A farmer has 216 m of fencing and wants to build two identical pens for his prize-winning pigs. The pens will be arranged as shown. Determine the dimensions of a pen that will maximize its area.



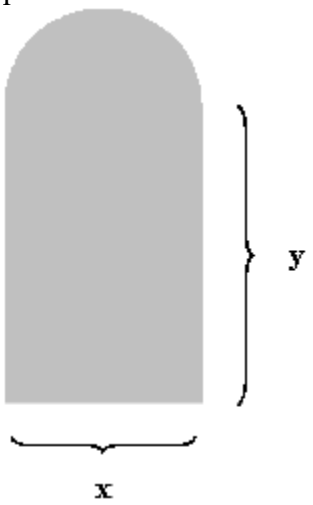
a. 7 m x 176 m
b. 21 m x 52 m
c. 27 m x 72 m
d. 9 m x 108 m
e. 27 m x 54 m

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ANSWER: e
POINTS: 1
REFERENCES: 3.1.81d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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50. A Norman window has the shape of a rectangle surmounted by a semicircle as in the figure below. If the perimeter of the window is 40 ft, express the area, A, as a function of the width, x, of the window.



a. $A(x) = \dfrac{160x - 4x^2 - \pi x^2}{8}$

b. $A(x) = \dfrac{80x - x^2}{2}$

c. $A(x) = \dfrac{80x - 2x^2 - \pi x^2}{4}$

d. $A(x) = \dfrac{80x + (2 - \pi)x^2}{4}$

e. $A(x) = \dfrac{160x - 4x^2 - \pi x^2}{2}$

ANSWER: a
POINTS: 1
REFERENCES: 3.1.84a
QUESTION TYPE: Multi-Mode (Multiple choice)
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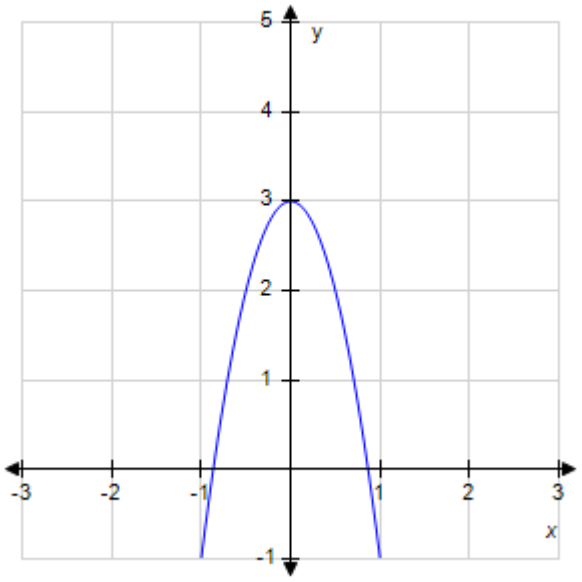
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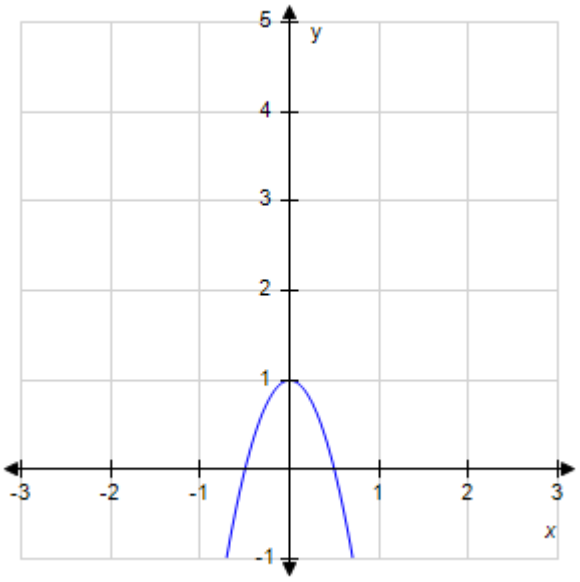
51. Graph the quadratic function.

$f(x) = -4x^2 + 2$

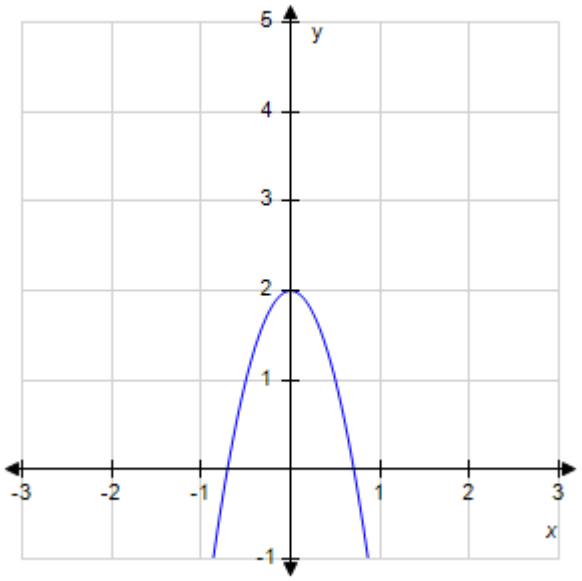
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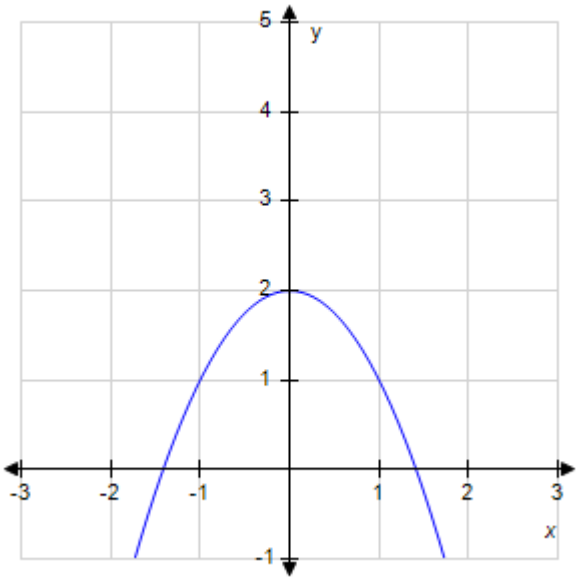
b.



c.



d.



ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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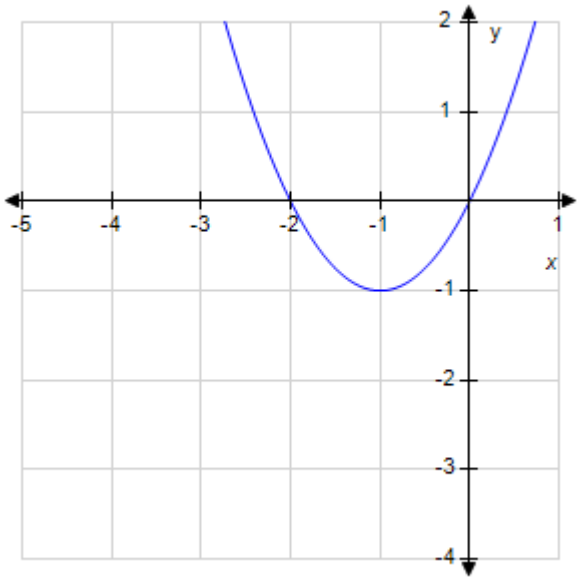
Section 2.1 - Quadratic Functions and Models

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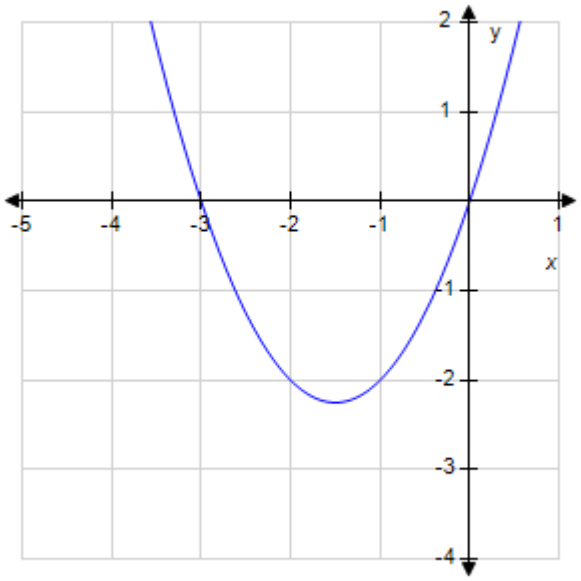
52. Graph the quadratic function.

$f(x) = x^2 + 2x$

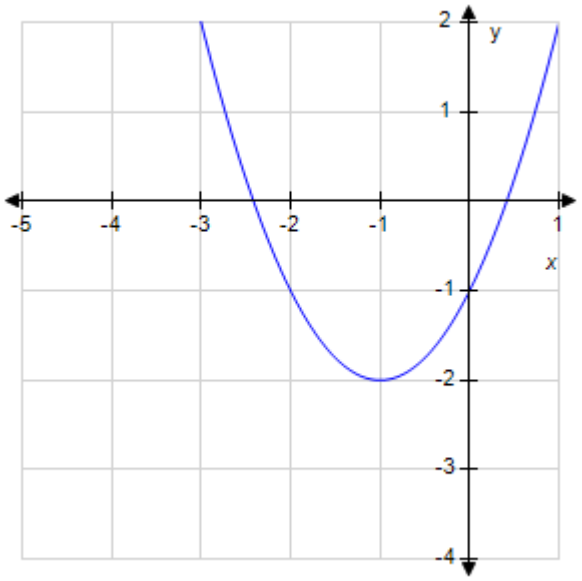
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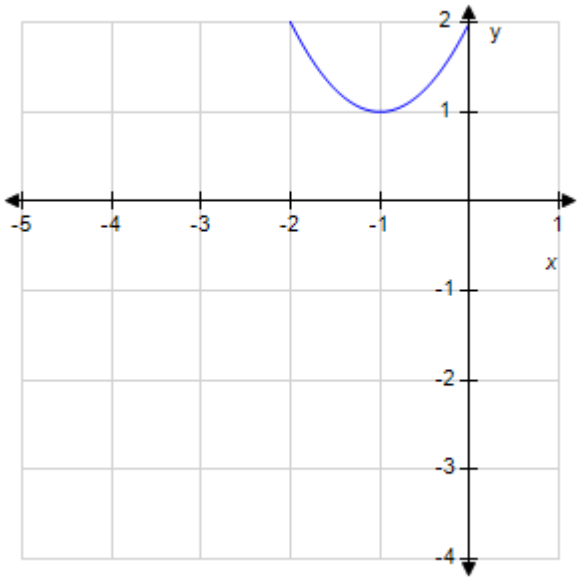
b.



c.



d.



ANSWER: a
POINTS: 1

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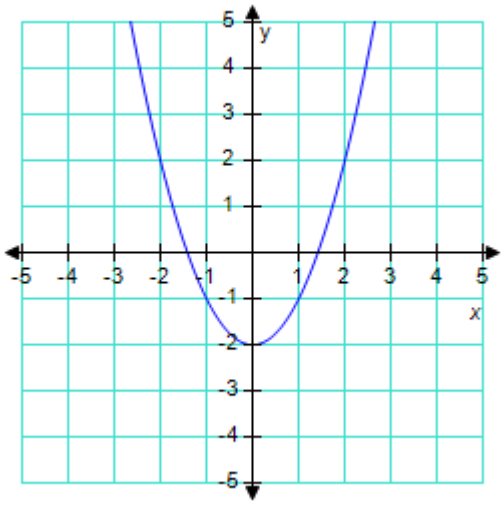
Section 2.1 - Quadratic Functions and Models

QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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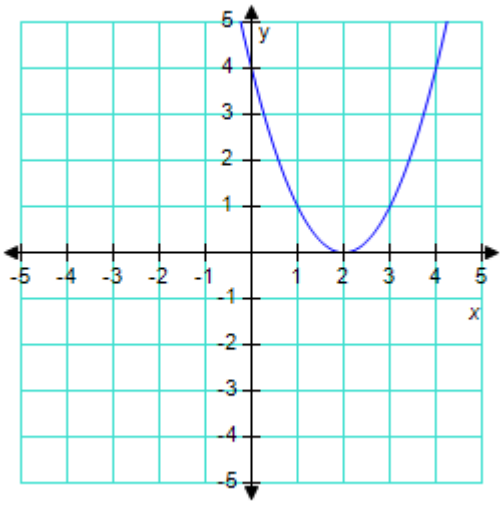
53. Graph the given function.

$f(x) = 2 - x^2$

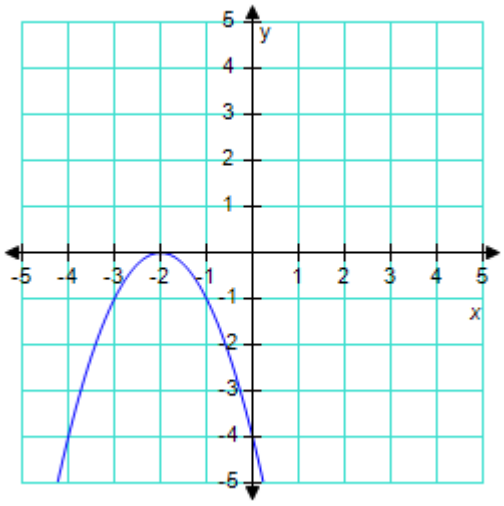
a.



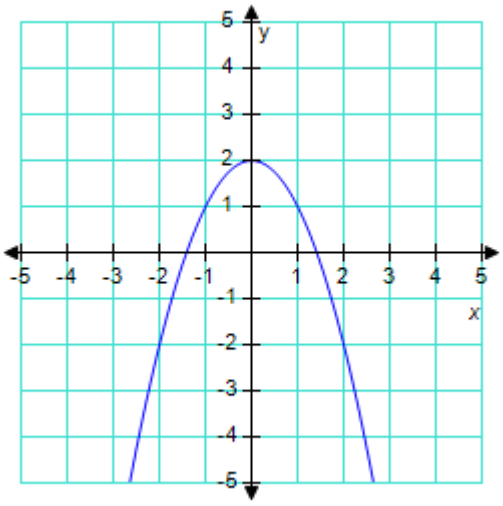
b.



c.

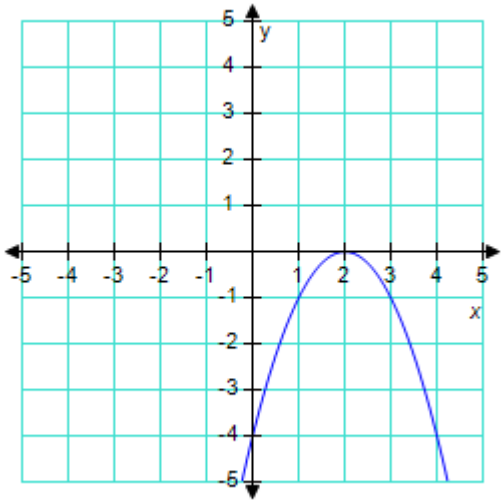


d.



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e.



ANSWER: d
POINTS: 1
REFERENCES: 66
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 3:56 PM

54. Find the vertex of the parabola.

$y = 3x^2 - 1$

a. $(-1, 3)$
b. $(0, -1)$
c. $(3, -1)$
d. $(-1, 0)$
e. $(0, 3)$

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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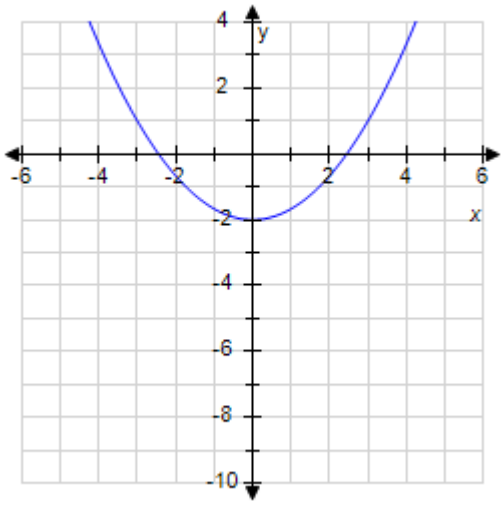
55. Graph the quadratic function.

$f(x) = -\frac{1}{3}x^2 - 2$

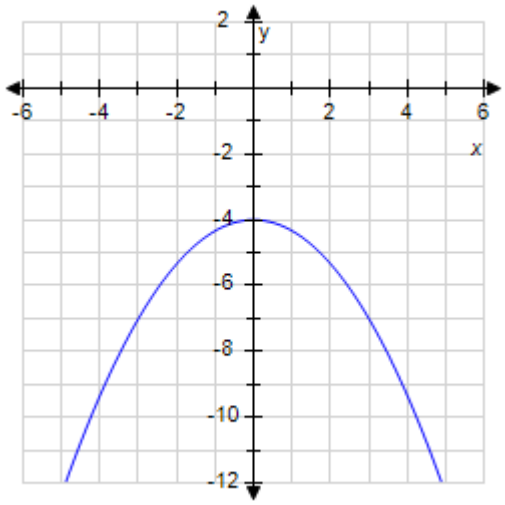
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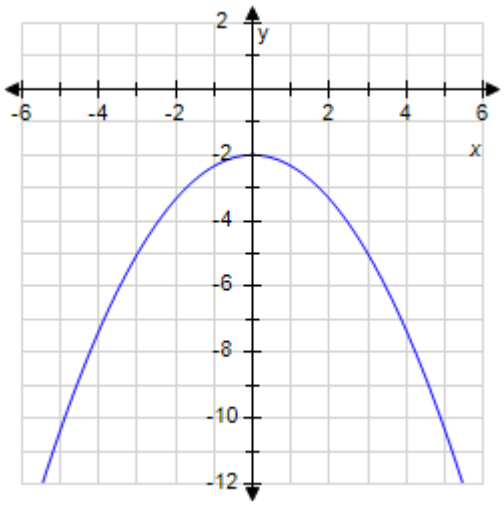
a.



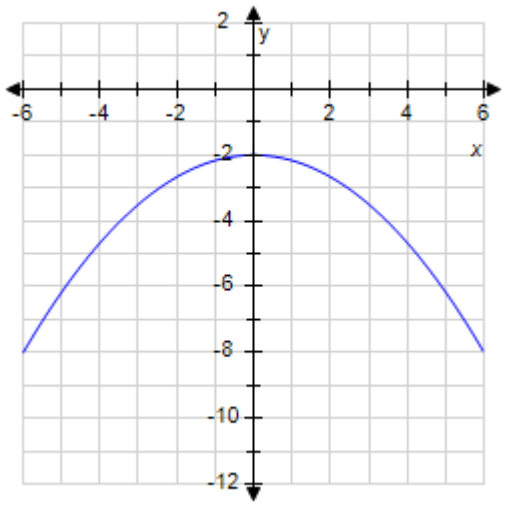
b.



c.



d.



ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/24/2014 8:46 AM

56. Find the vertex of the parabolic graph defined by the following equation.

$y = 4(x - 5)^2 + 7$

a. (5, 0)
b. (25, 7)

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c. (5, 4)
d. (7, 5)
e. (5, 7)

ANSWER: e
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:20 PM

57. Find the vertex of the parabola.

$y = x^2 - 12x + 36$

a. (6, 0)
b. (0, 6)
c. (–24, 0)
d. (36, 0)
e. (6, –24)

ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:16 PM

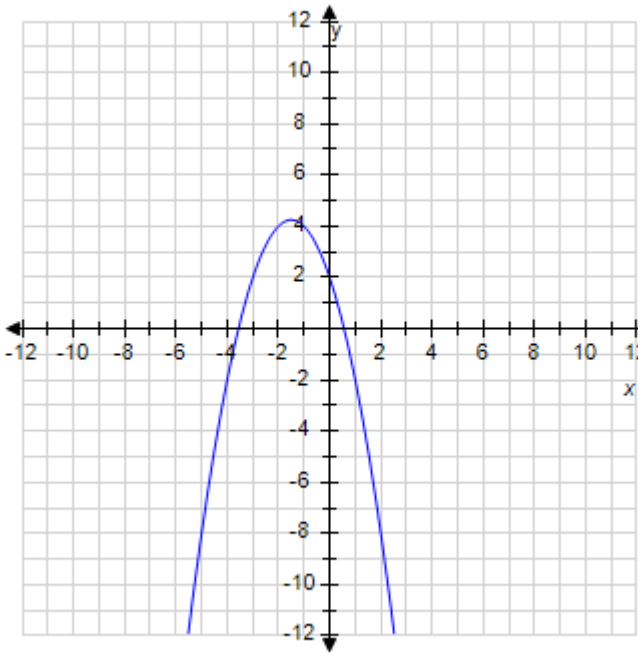
58. Graph the quadratic function.

$f(x) = -x^2 - 3x + 3$

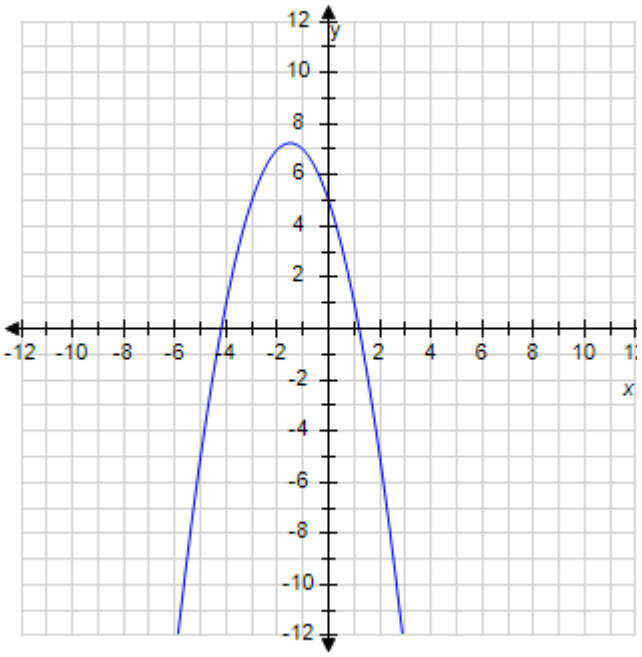
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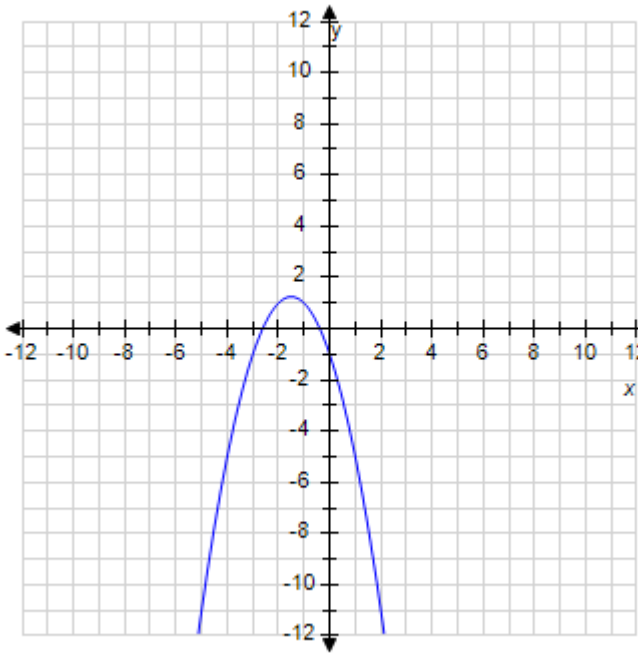
a.



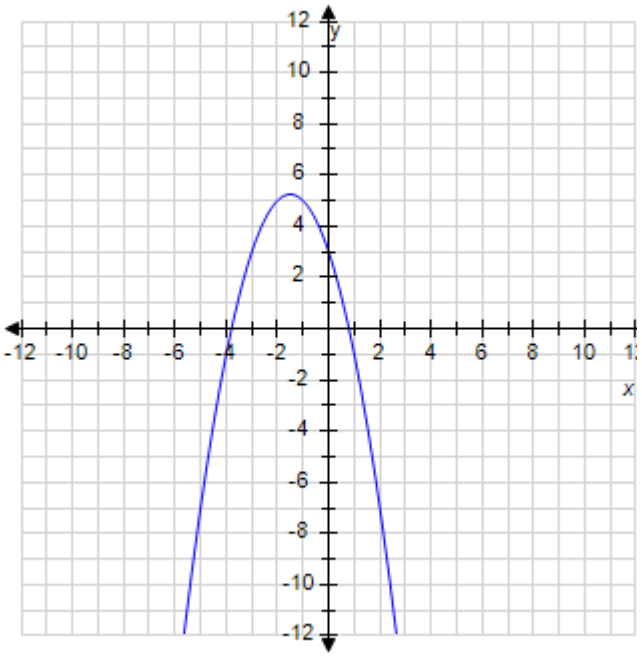
b.



c.



d.



ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.1 - Quadratic Functions and Models

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59. Find the vertex of the parabola.

$y = -x^2 + 16x - 60$

a. $(-8, 4)$
b. $(8, 4)$
c. $(-8, -4)$
d. $(8, -30)$
e. $(4, 8)$

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/17/2021 4:13 PM

60. Find the vertex of the parabola.

$y = x^2 + 14x + 49$

Please enter your answer as an ordered pair.
ANSWER: $(-7, 0)$

POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/7/2014 5:30 AM

61. The function $f(x) = x^2 - 5$ is one-to-one on the domain $(x \le 0)$. Find $f^{-1}(x)$.

a. $f^{-1}(x) = x^2 + 5$
b. $f^{-1}(x) = \sqrt{x + 5}$
c. $f^{-1}(x) = -\sqrt{x + 5}$
d. $f^{-1}(x) = \dfrac{1}{x^2 - 5}$
e. $f^{-1}(x) = \sqrt{x - 5}$

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ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:21 PM
DATE MODIFIED: 10/17/2014 4:31 AM

62. Find the inverse of the one-to-one function.

$y = 7x + 5$

a. $y = \dfrac{x-7}{5}$

b. $y = \dfrac{x-5}{7}$

c. $y = \dfrac{7}{x-5}$

d. $y = \dfrac{x+5}{7}$

e. none of the above

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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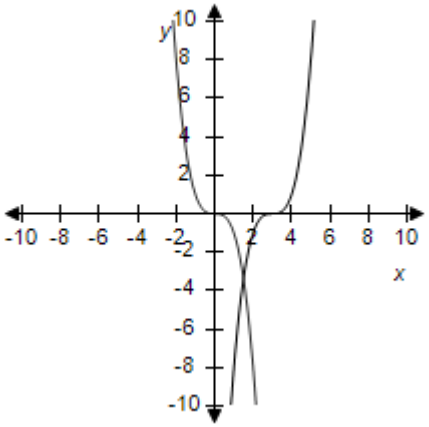
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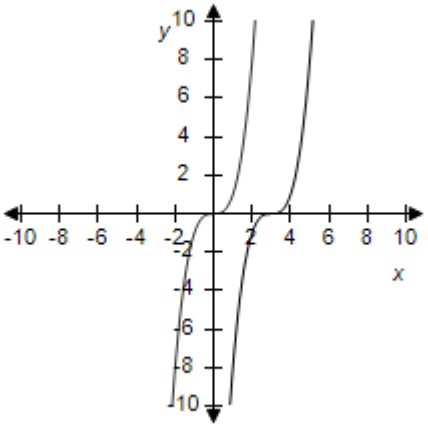
Section 2.2 - Polynomial Functions of Higher Degree

1. Select the graph of $y = x^3$ and the transformation $f(x) = (x-3)^3$.

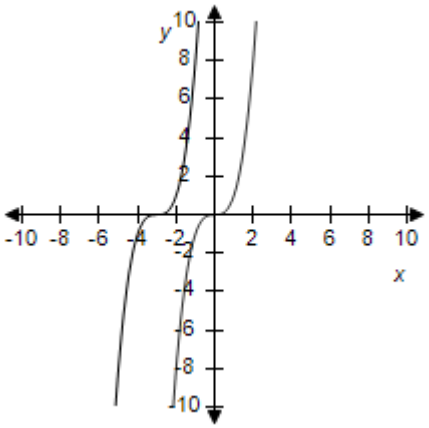
a.



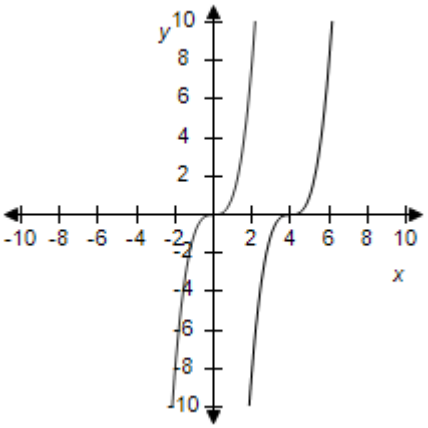
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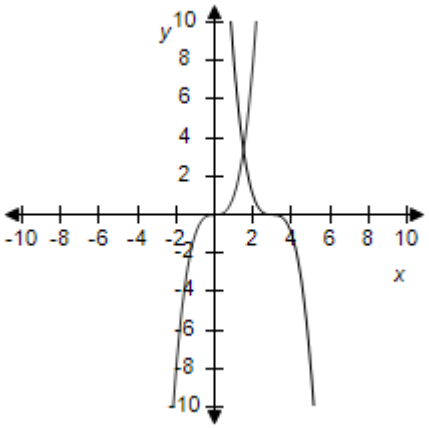
c.



d.



e.



ANSWER: b
POINTS: 1
REFERENCES: 3.2.17a
QUESTION TYPE: Multi-Mode (Multiple choice)

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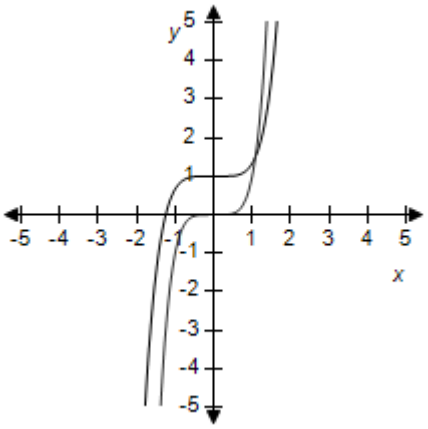
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Section 2.2 - Polynomial Functions of Higher Degree

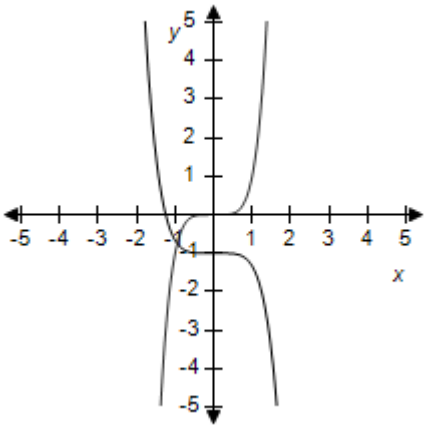
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:21 AM

2. Select the graph of $y = x^5$ and the transformation $f(x) = 1 - \frac{1}{3}x^5$.

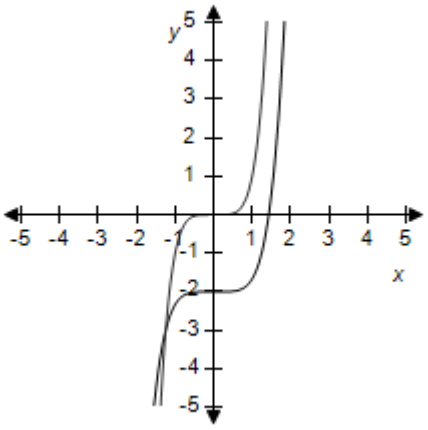
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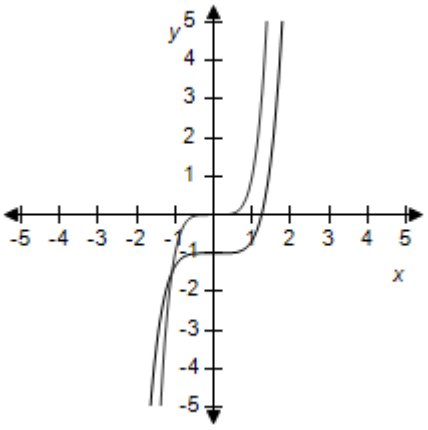
b.



c.



d.

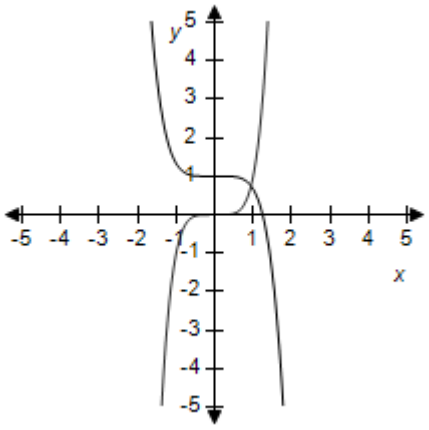


e.

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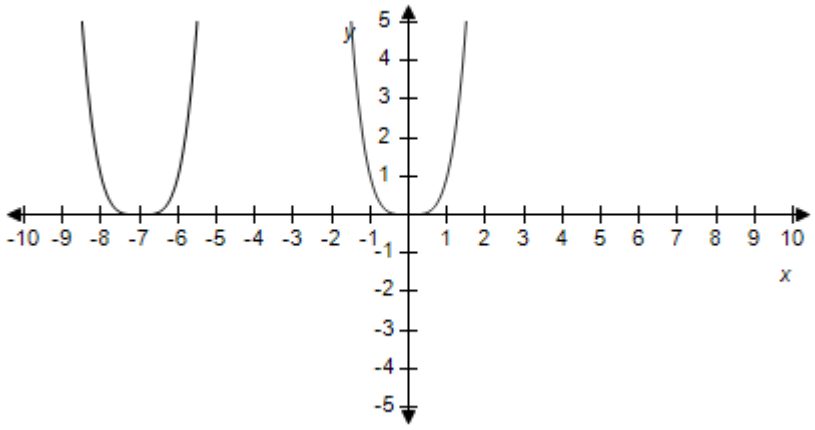
Section 2.2 - Polynomial Functions of Higher Degree



ANSWER: e
POINTS: 1
REFERENCES: 3.2.18c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:28 AM

3. Select the graph of $y = x^4$ and the transformation $f(x) = (x+4)^4$.

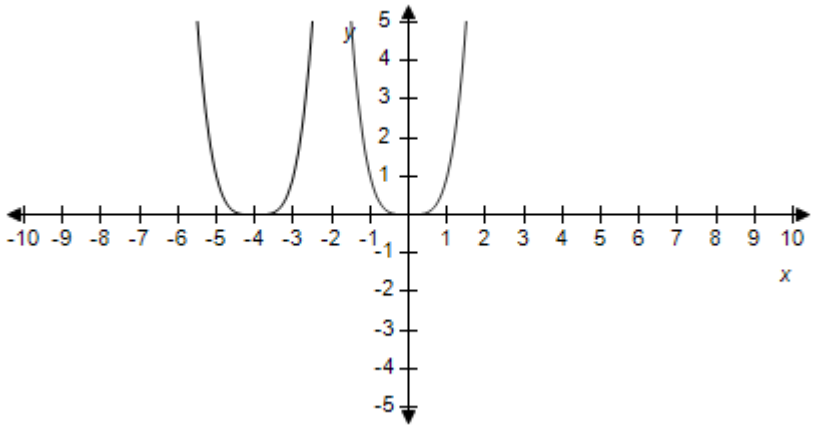
a.



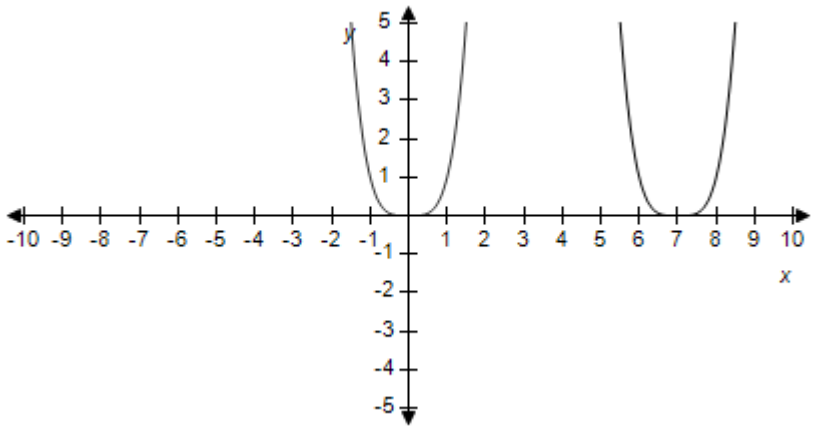
b.

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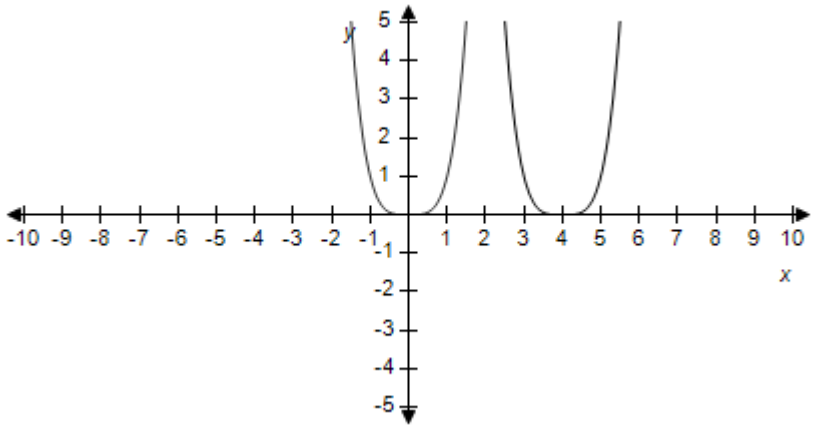
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c.



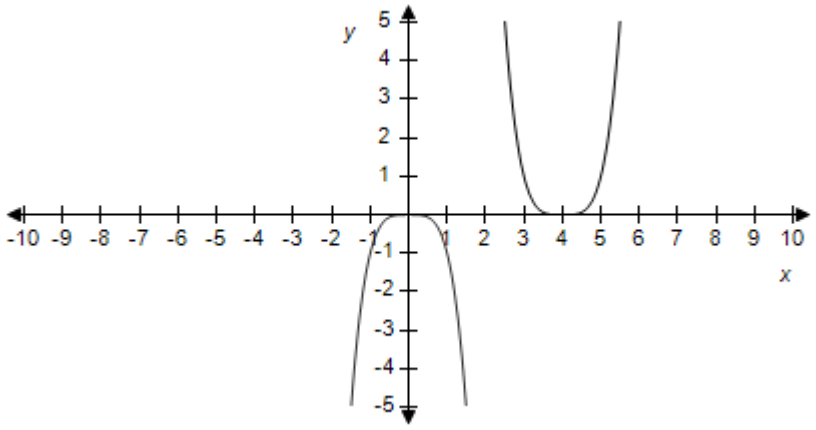
d.



e.

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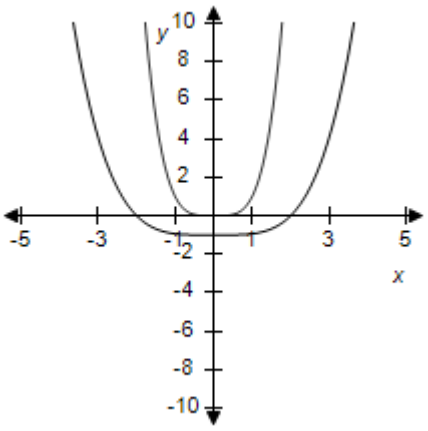
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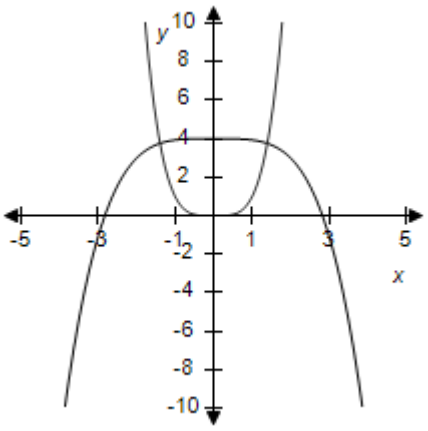
ANSWER: b
POINTS: 1
REFERENCES: 3.2.19a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:31 AM

4. Select the graph of $y = x^4$ and the transformation $f(x) = \left(\frac{1}{2}x\right)^4 - 4$.

a.



b.

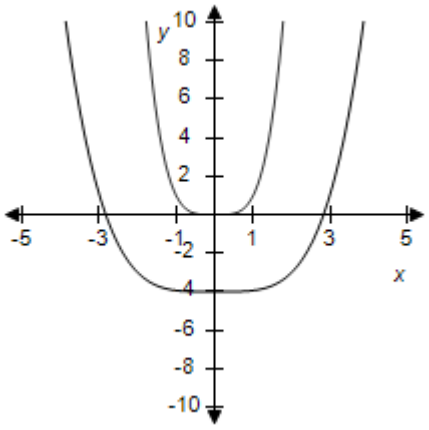


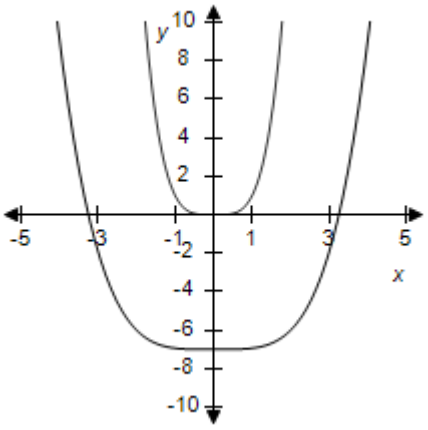
c.

d.

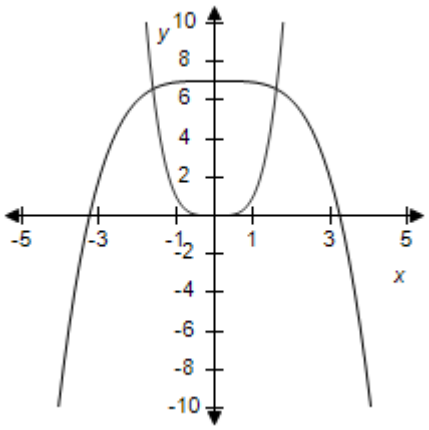
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e.



ANSWER: c
POINTS: 1
REFERENCES: 3.2.19f
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:34 AM

5. Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

$$f(x) = \frac{1}{2}x^3 + 3x$$

a. Rises to the left, falls to the right
b. Rises to the right, rises to the left
c. Falls to the left, rises to the right
d. Falls to the right
e. Falls to the left, falls to the right

ANSWER: c

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POINTS: 1
REFERENCES: 3.2.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/1/2014 9:01 AM

6. Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

$f(x) = 2x^2 - 3x + 5$

a. Falls to the left, rises to the right
b. Falls to the left, falls to the right
c. Rises to the left, rises to the right
d. Rises to the left, falls to the right
e. Falls to the left

ANSWER: c
POINTS: 1
REFERENCES: 3.2.22
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/1/2014 9:04 AM

7. Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

$f(t) = 2 - 3t + 5t^2 - 3t^3$

a. Falls to the left, falls to the right
b. Rises to the left, rises to the right
c. Rises to the left, falls to the right
d. Falls to the left, rises to the right
e. Falls to the left

ANSWER: c
POINTS: 1
REFERENCES: 3.2.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:35 AM

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Section 2.2 - Polynomial Functions of Higher Degree

8. Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

$$f(t) = -\frac{1}{2}(t^2 - 3t + 5)$$

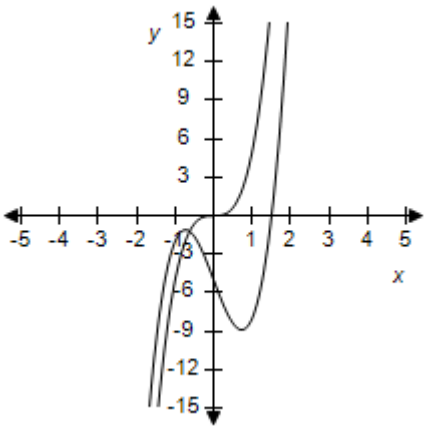
a. Rises to the left, rises to the right
b. Falls to the left, rises to the right
c. Falls to the left, falls to the right
d. Rises to the left, falls to the right
e. Rises to the left

ANSWER: c
POINTS: 1
REFERENCES: 3.2.29
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/28/2021 8:38 AM

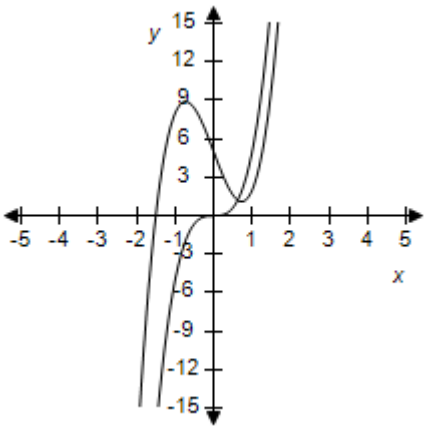
9. Select the correct graph of the functions f and g in the same viewing window. Zoom out sufficiently far to show that the right-hand and left-hand behaviors of f and g appear identical.

$$f(x) = 5x^3 - 8x + 1, \quad g(x) = 5x^3$$

a.



b.

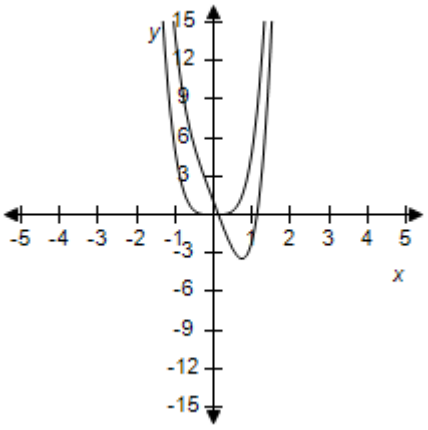


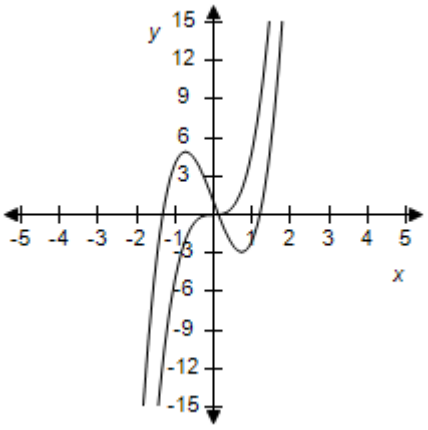
c.

d.

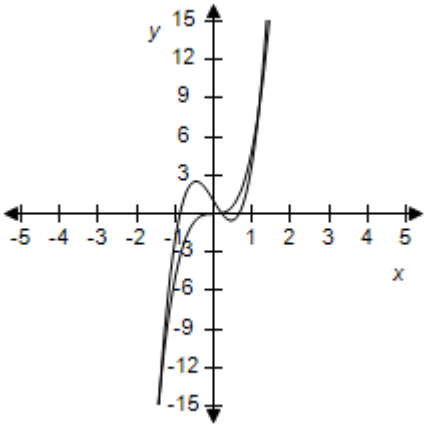
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e.



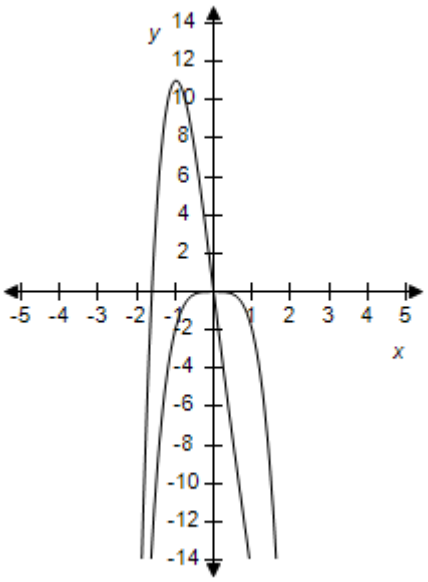
ANSWER: d
POINTS: 1
REFERENCES: 3.2.31
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 8:41 AM

10. Select the correct graph of the functions f and g which shows that the right-hand and left-hand behaviors of f and g appear identical.

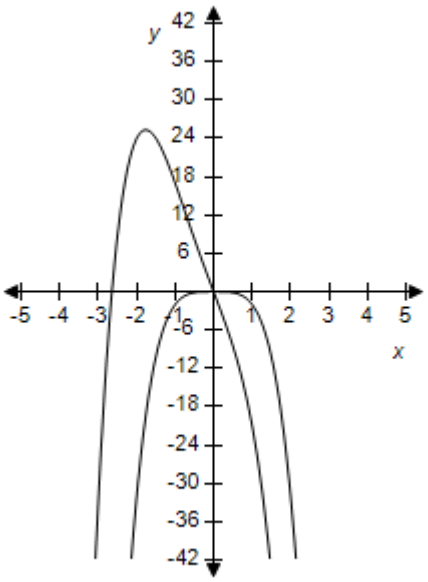
$f(x) = -\left(2x^4 - 3x^3 + 16x\right)$, $g(x) = -2x^4$

a. b.

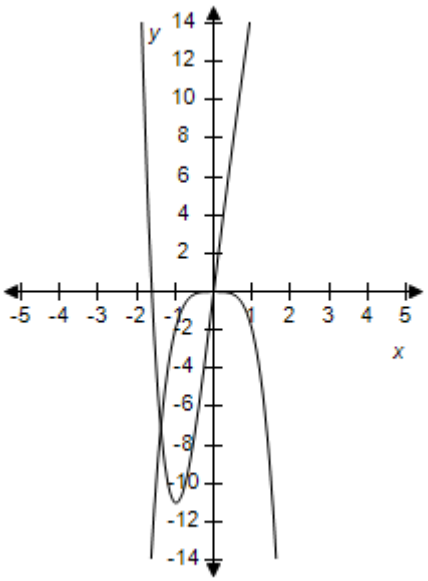
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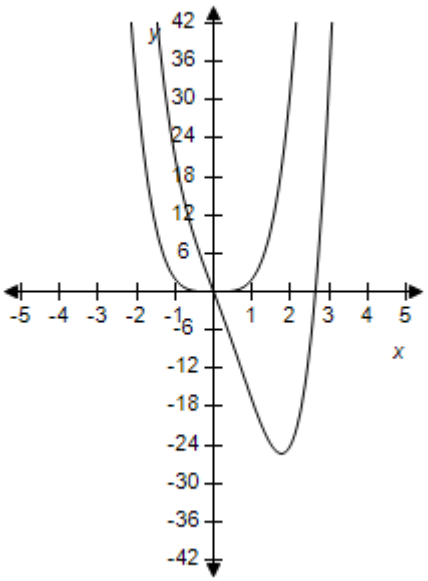
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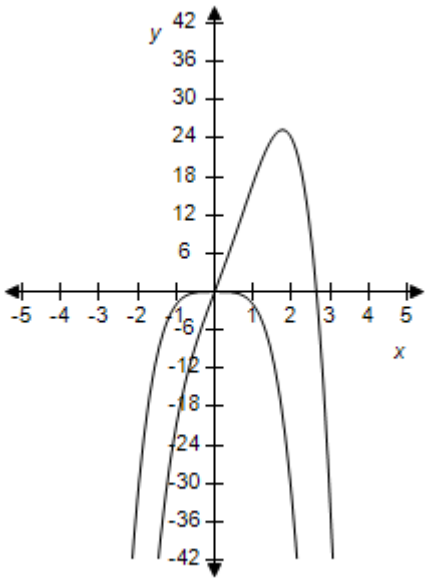
d.



e.



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ANSWER: a
POINTS: 1
REFERENCES: 3.2.33
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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11. Find all the real zeros of the polynomial function.

$f(x) = x^2 - 9$

a. -9
b. 3
c. -3
d. 9
e. ± 3

ANSWER: e
POINTS: 1
REFERENCES: 3.2.35a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.2 - Polynomial Functions of Higher Degree

12. Find all the real zeros of the polynomial function and determine the multiplicity of each zero and the number of turning points of the graph of the function.

$h(t) = t^2 - 14t + 49$

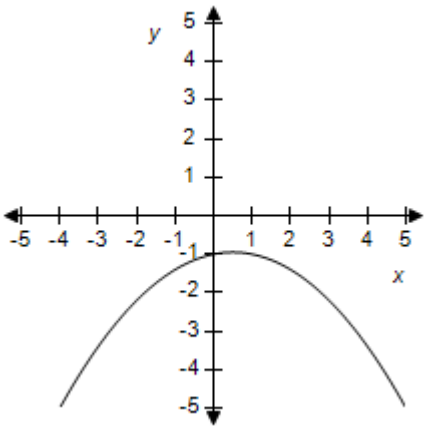
a. All Real Zeros: $0, 7$; Even multiplicity; number of turning points: 2
b. All Real Zeros: 7; Even multiplicity; number of turning points: 1
c. All Real Zeros: $0, 49$; Odd multiplicity; number of turning points: 2
d. All Real Zeros: $0, 1, 7$; Even multiplicity; number of turning points: 3
e. All Real Zeros: 7; Odd multiplicity; number of turning points: 1

ANSWER: b
POINTS: 1
REFERENCES: 3.2.37b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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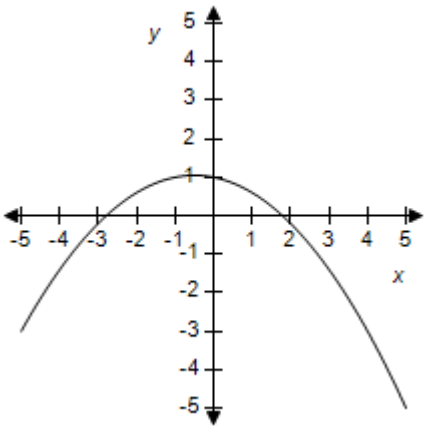
13. Select the correct graph of the function.

$f(x) = \frac{1}{5}x^2 + \frac{1}{5}x - \frac{5}{5}$

a.



b.

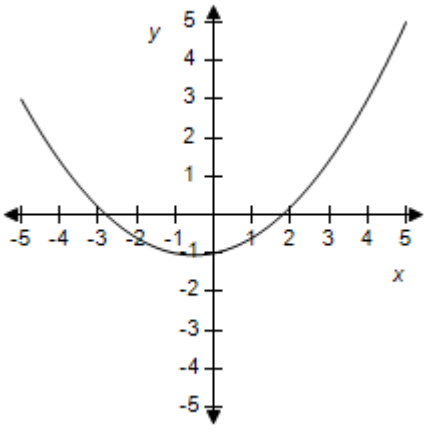


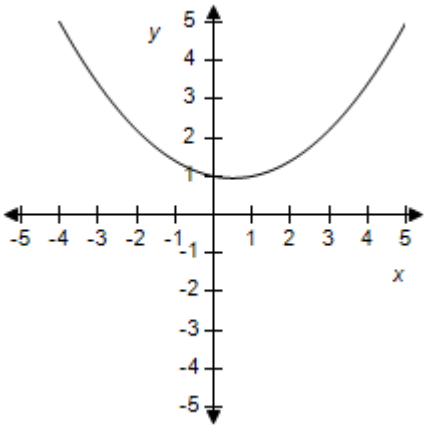
c.

d.

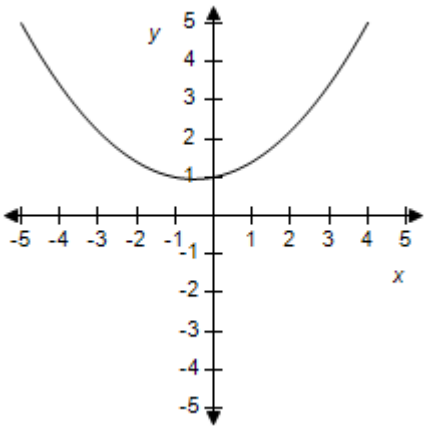
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e.



ANSWER: c
POINTS: 1
REFERENCES: 3.2.39c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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14. Find all the real zeros of the polynomial function.

$f(x) = x^5 - 18x^3 + 81x$

a. $0, \pm\sqrt{9}$
b. $0, \sqrt{9}$
c. $0, 9$
d. $0, -9$
e. $0, -\sqrt{9}$

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ANSWER: a
POINTS: 1
REFERENCES: 3.2.45a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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15. Determine the number of turning points of the graph of the function.

$f(x) = 2x^4 + 4x^2 + 4$

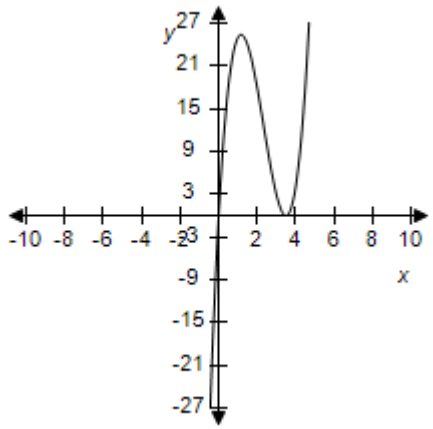
a. Number of turning points: 3
b. Number of turning points: 1
c. Number of turning points: 5
d. Number of turning points: 2
e. Number of turning points: 4

ANSWER: b
POINTS: 1
REFERENCES: 3.2.47b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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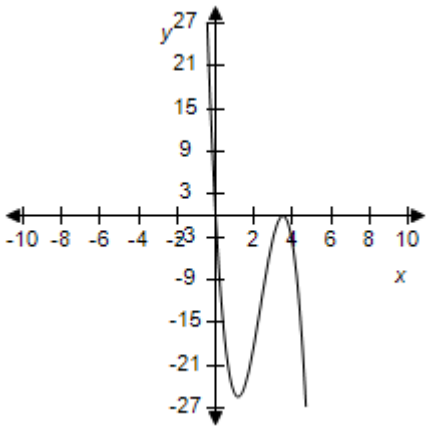
16. Select the correct graph of the function.

$y = 4x^3 - 28x^2 + 49x$

a.



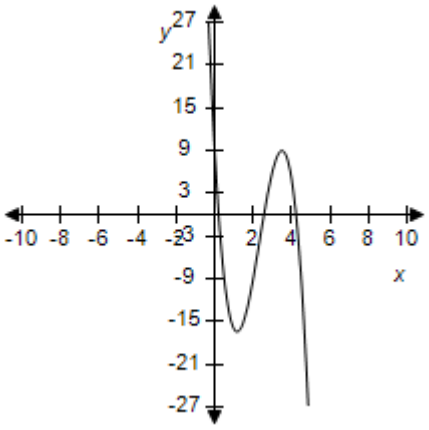
b.

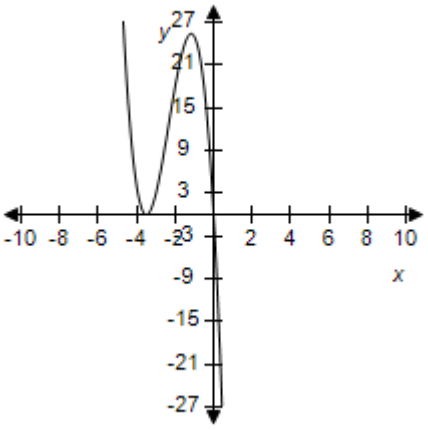


c.

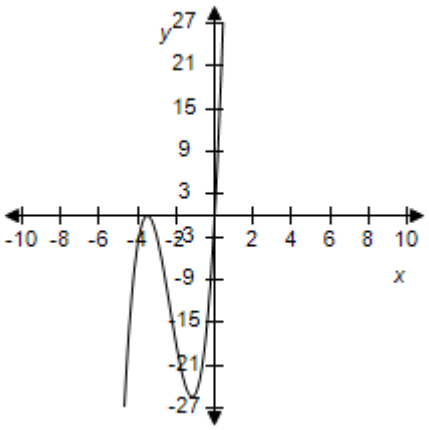
d.

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e.



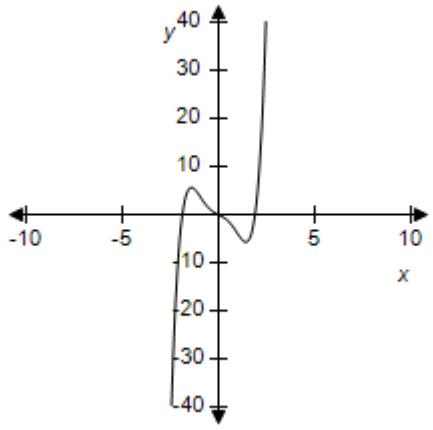
ANSWER: a
POINTS: 1
REFERENCES: 3.2.51a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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17. Select the correct graph of the function.

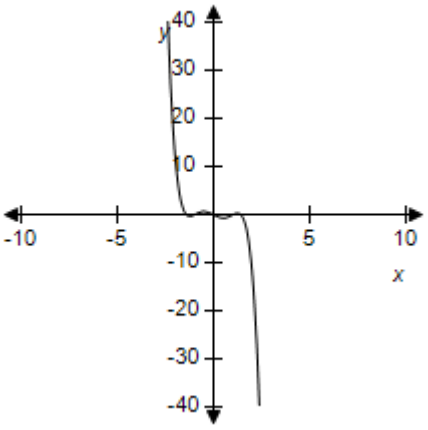
$y = x^5 - 3x^3 + 2x$

a. b.

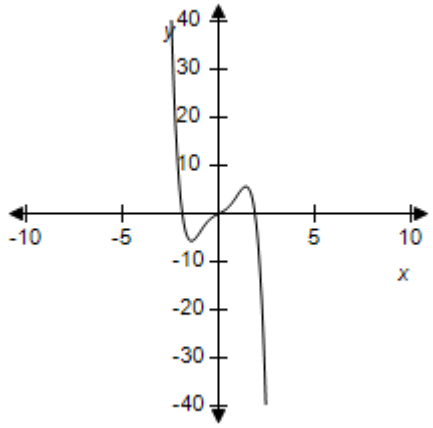
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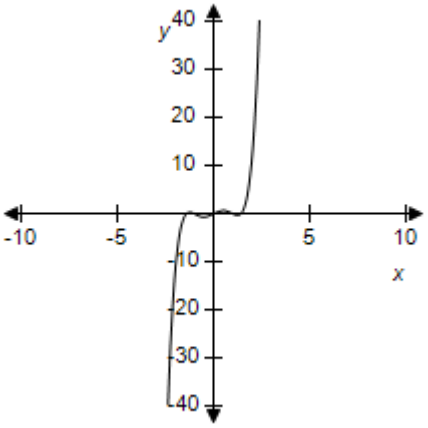
c.

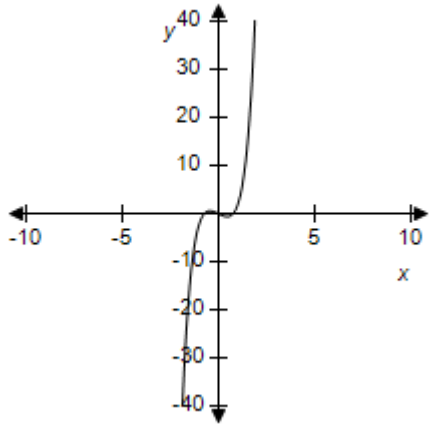


d.



e.





ANSWER: d
POINTS: 1
REFERENCES: 3.2.53a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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18. Select from the following which is the polynomial function that has the given zeros.

$0, 5$

a. $f(x) = x^2 - 5x$

b. $f(x) = x^3 + x^2 - 5x$

c. $f(x) = x - 5$

d. $f(x) = x + 5$

e. $f(x) = x^2 + 5x$

ANSWER: a
POINTS: 1
REFERENCES: 3.2.55
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/1/2014 10:32 AM

19. Select from the following which is the polynomial function that has the given zeros.

$5, -7$

a. $f(x) = x^2 - 2x + 35$

b. $f(x) = x^2 + 2x + 35$

c. $f(x) = -x^2 - 2x - 35$

d. $f(x) = -x^2 + 2x - 35$

e. $f(x) = x^2 + 2x - 35$

ANSWER: e
POINTS: 1
REFERENCES: 3.2.57
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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20. Select from the following which is the polynomial function that has the given zeros.

$0, -7, -3$

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a. $f(x) = -x^3 + 10x^2 + 21x$

b. $f(x) = x^3 - 10x^2 + 21x$

c. $f(x) = x^3 + 10x^2 + 21x$

d. $f(x) = x^3 - 10x^2 - 21x$

e. $f(x) = x^3 + 10x^2 - 21x$

ANSWER: c
POINTS: 1
REFERENCES: 3.2.59
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 10/1/2014 10:40 AM

21. Select from the following which is the polynomial function that has the given zeros.

$-4, -2, 0, 2, 4$

a. $f(x) = x^5 - 20x^3 + 64$

b. $f(x) = x^5 + 20x^3 + 64x$

c. $f(x) = x^5 - 20x^3 + 64x$

d. $f(x) = -x^5 - 20x^3 + 64x$

e. $f(x) = x^5 - 20x^3 - 64x$

ANSWER: c
POINTS: 1
REFERENCES: 3.2.62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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22. Select from the following which is the polynomial function that has the given zeros.

$1 + \sqrt{5}, 1 - \sqrt{5}$

a. $f(x) = -x^2 - 2x - 4$

b. $f(x) = -x^2 - 2x + 4$

c. $f(x) = x^2 - 2x - 4$

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d. $f(x) = x^2 - 2x + 4$

e. $f(x) = x^2 + 2x - 4$

ANSWER: c
POINTS: 1
REFERENCES: 3.2.63
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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23. Select from the following which is the polynomial of degree n that has the given zero(s).

Zero	*Degree*
$x = -7$	$n = 2$

a. $f(x) = x^2 + 14x + 49$

b. $f(x) = x^2 - 14x - 49$

c. $f(x) = -x^2 + 14x + 49$

d. $f(x) = x^2 - 14x + 49$

e. $f(x) = x^2 + 14x - 49$

ANSWER: a
POINTS: 1
REFERENCES: 3.2.69
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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24. Select from the following which is the polynomial of degree n that has the given zero(s).

Zeros	*Degree*
$x = 0, \sqrt{5}, -\sqrt{5}$	$n = 3$

a. $f(x) = x^3 + \sqrt{5}x$

b. $f(x) = x^3 + 5x$

c. $f(x) = -x^3 - 5x$

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d. $f(x) = x^3 - \sqrt{5}x$

e. $f(x) = x^3 - 5x$

ANSWER: e
POINTS: 1
REFERENCES: 3.2.65
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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25. Select from the following which is the polynomial of degree n that has the given zero(s).

Zero	*Degree*
$x = 3$	$n = 3$

a. $f(x) = x^3 - 9x^2 + 27x - 27$

b. $f(x) = x^3 + 9x^2 + 27x - 27$

c. $f(x) = x^3 + 9x^2 + 27x + 27$

d. $f(x) = x^3 - 9x^2 + 27x + 27$

e. $f(x) = x^3 - 9x^2 - 27x - 27$

ANSWER: a
POINTS: 1
REFERENCES: 3.2.70
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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26. Select from the following which is the polynomial of degree n that has the given zero(s).

Zeros	Degree
$x = 0, -3$	$n = 5$

a. $f(x) = x^5 + 12x^4 + 54x^3 + 108x^2 + 81x$

b. $f(x) = x^5 - 12x^4 + 54x^3 + 108x^2 + 81x$

c. $f(x) = x^5 + 12x^4 + 54x^3 + 108x^2 - 81x$

d. $f(x) = x^5 + 12x^4 - 54x^3 + 108x^2 + 81x$

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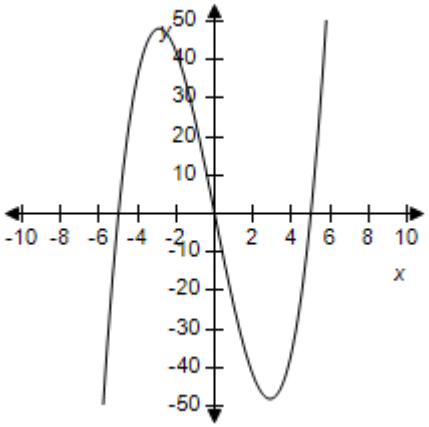
e. $f(x) = x^5 + 12x^4 + 54x^3 - 108x^2 + 81x$

ANSWER: a
POINTS: 1
REFERENCES: 3.2.73
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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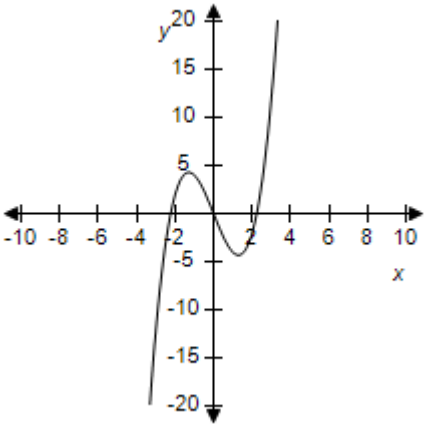
27. Select the graph of the function and determine the zeros of the polynomial.

$f(x) = x^3 - 25x$

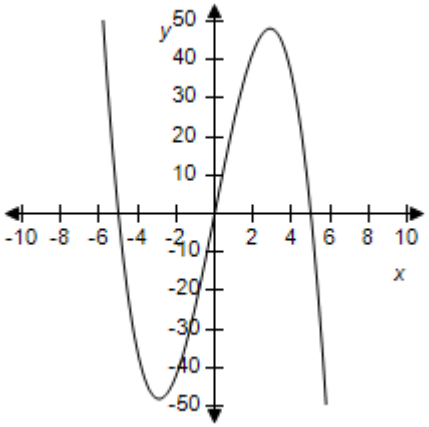
a. $0, 5, -5$



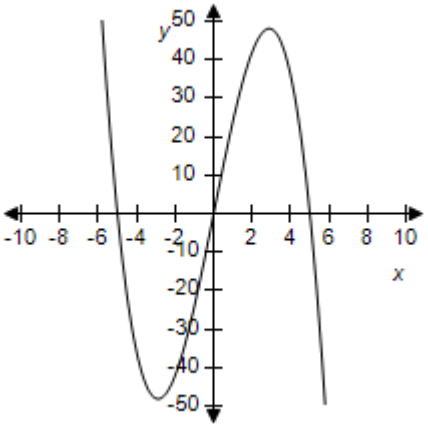
b. $0, 5, -5$



c. $0, 5, -5$



d. $5, -5$

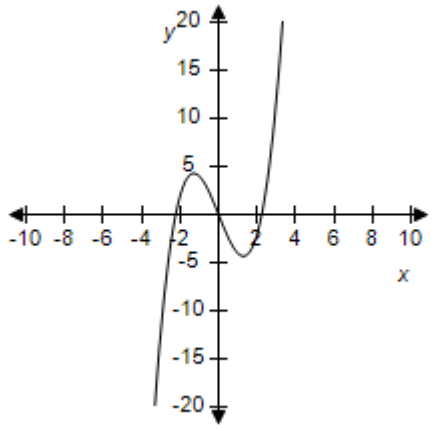


e. $5, -5$

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Section 2.2 - Polynomial Functions of Higher Degree

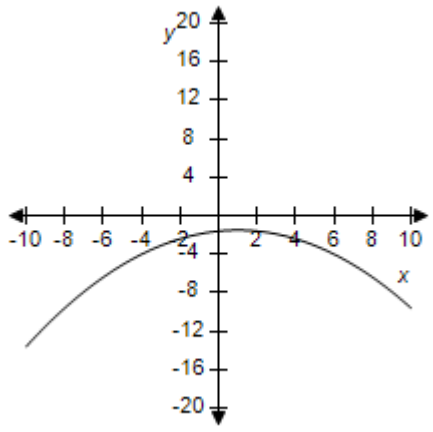


ANSWER: a
POINTS: 1
REFERENCES: 3.2.75b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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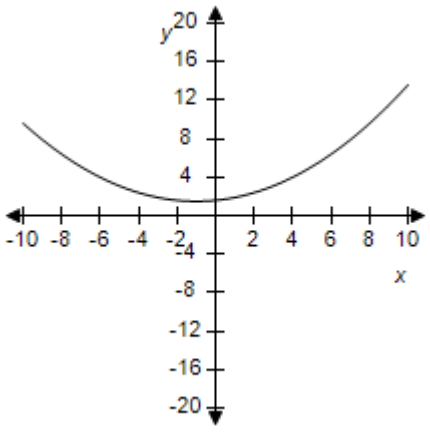
28. Select the graph of the function and determine the zeros of the polynomial.

$$f(t) = \frac{1}{10}\left(t^2 - 2t + 16\right)$$

a. No zeros



b. No zeros

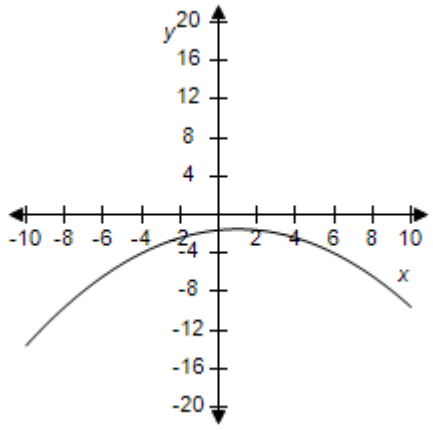


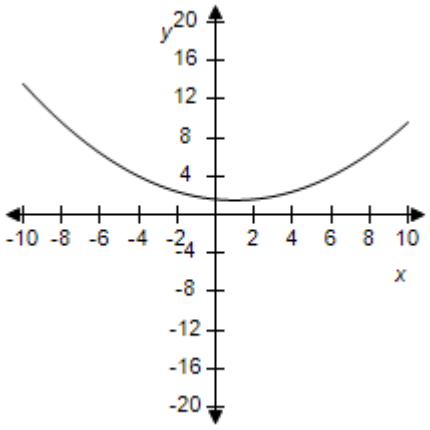
c. $0, 10, -10$

d. No zeros

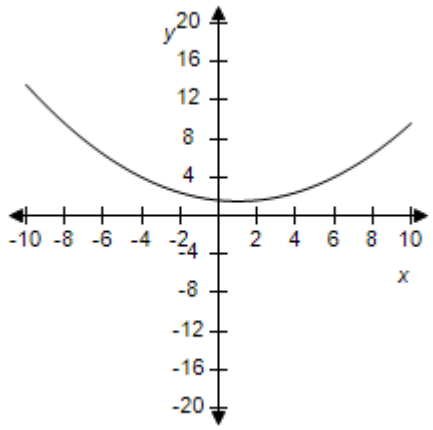
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Section 2.2 - Polynomial Functions of Higher Degree





e. $10, -10$



ANSWER: d
POINTS: 1
REFERENCES: 3.2.77b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 9:56 AM

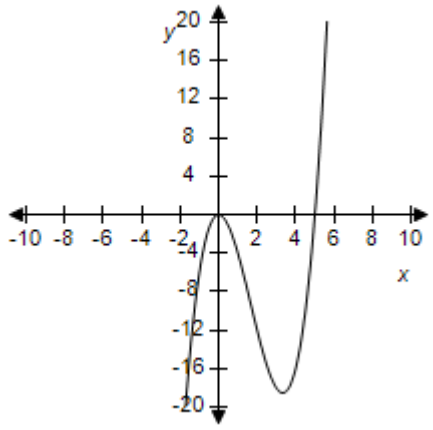
29. Select the graph of the function and determine the zeros of the polynomial.

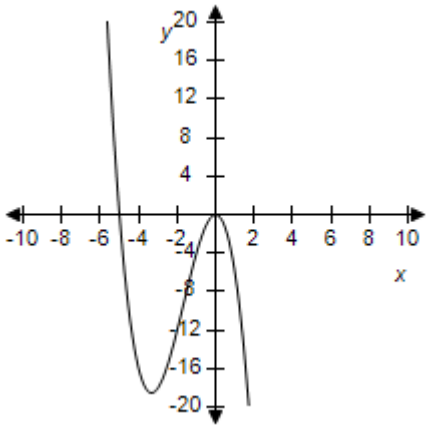
$f(x) = x^3 - 5x^2$

a. $0, 5$

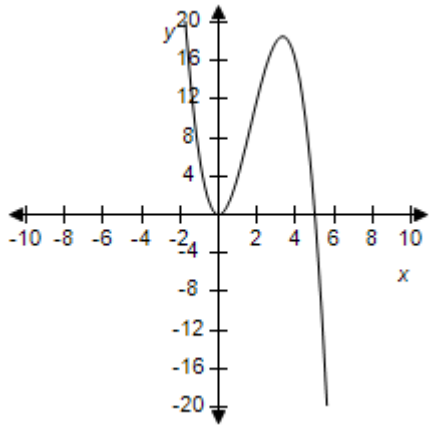
b. $0, -5$

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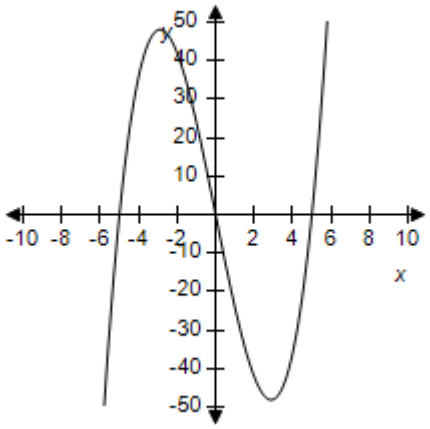




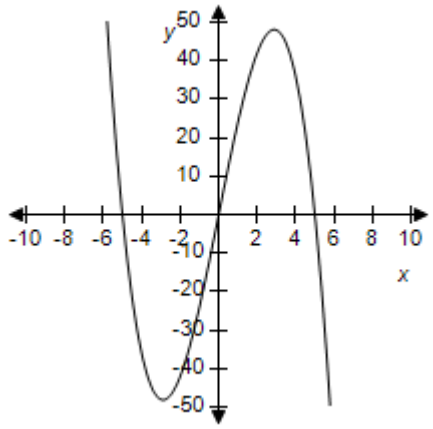
c. $0, 5$



d. $0, 5, -5$



e. $0, 5, -5$



ANSWER: a
POINTS: 1
REFERENCES: 3.2.79b

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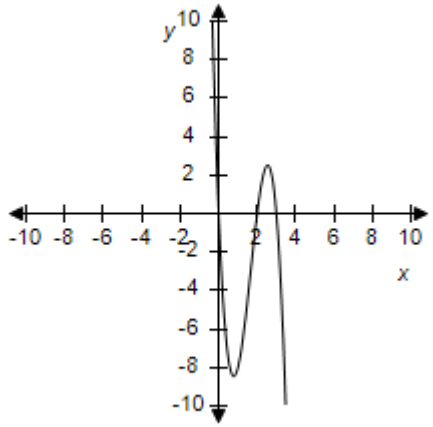
Section 2.2 - Polynomial Functions of Higher Degree

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STUDENT ENTRY MODE: Basic
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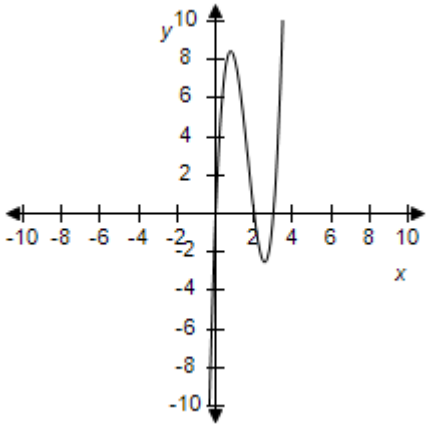
30. Sketch the graph of the function by finding the zeros of the polynomial.

$f(x) = 4x^3 - 20x^2 + 24x$

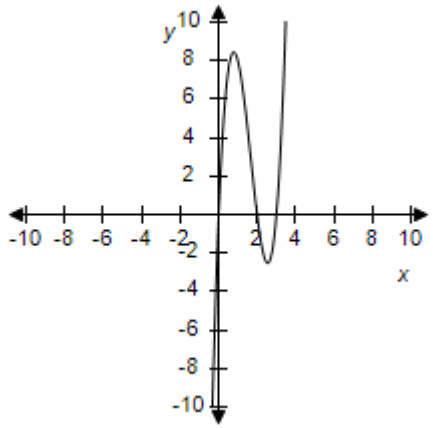
a. 0, 2, 3



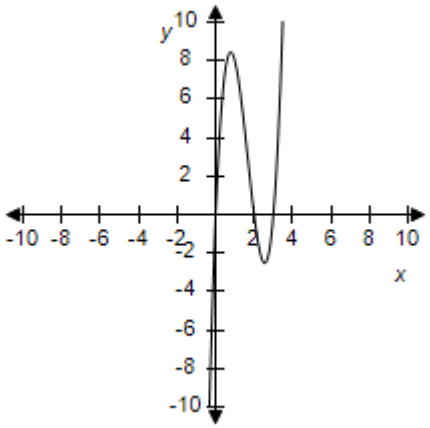
b. 0, 2, -3



c. 0, -2, 3



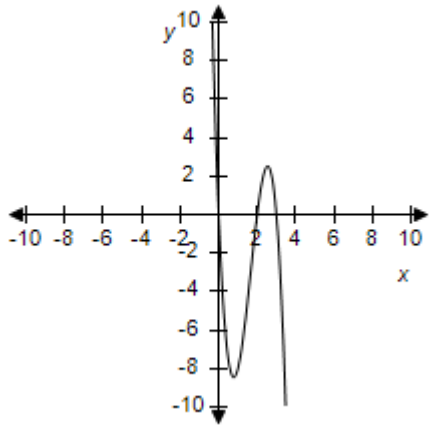
d. 0, 2, 3



e. 0, -2, -3

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Section 2.2 - Polynomial Functions of Higher Degree

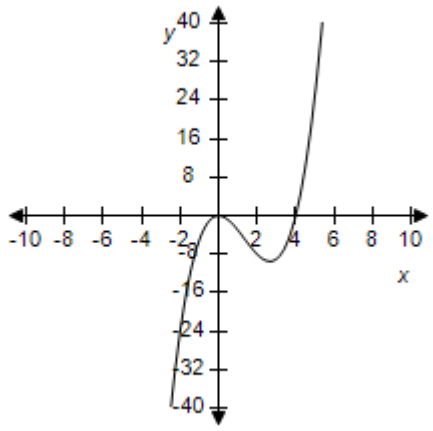


ANSWER: d
POINTS: 1
REFERENCES: 3.2.81b
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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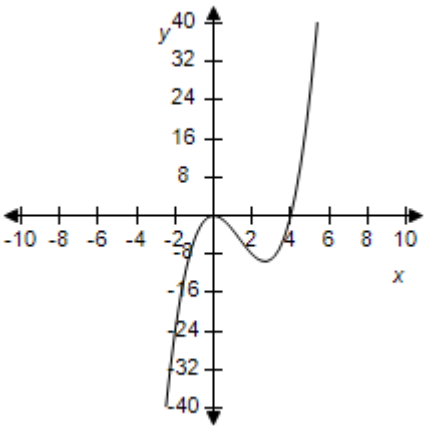
31. Select the graph of the function and determine the zeros of the polynomial.

$f(x) = x^2(x-4)$

a. $0, 4, -4$



b. $0, 4$

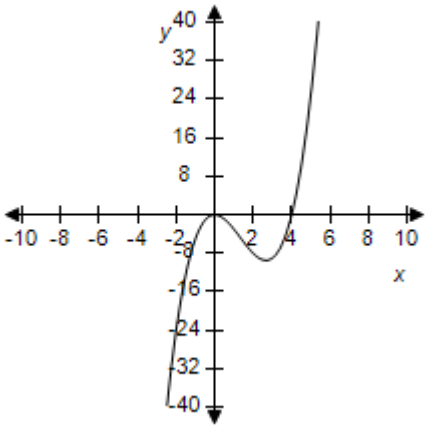


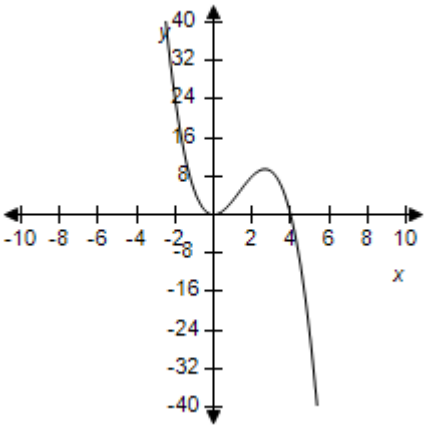
c. $0, -4$

d. $0, 4$

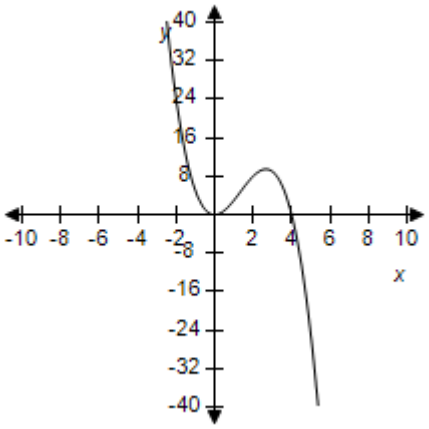
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Section 2.2 - Polynomial Functions of Higher Degree





e. $0, -4$



ANSWER: b
POINTS: 1
REFERENCES: 3.2.85b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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32. Select the graph of the function and determine the zeros of the polynomial.

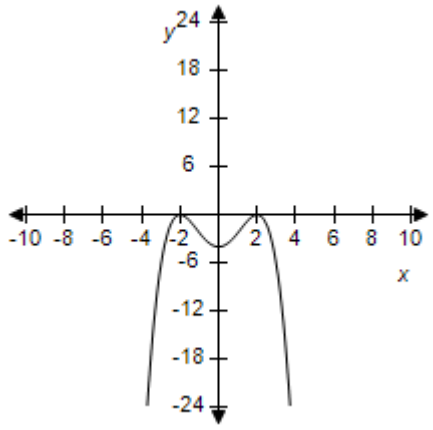
$$g(t) = -\frac{1}{4}(t-2)^2(t+2)^2$$

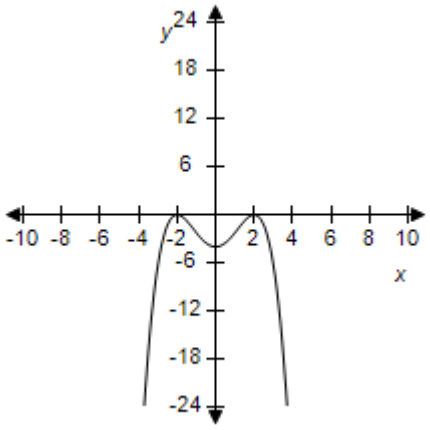
a. -2

b. 2

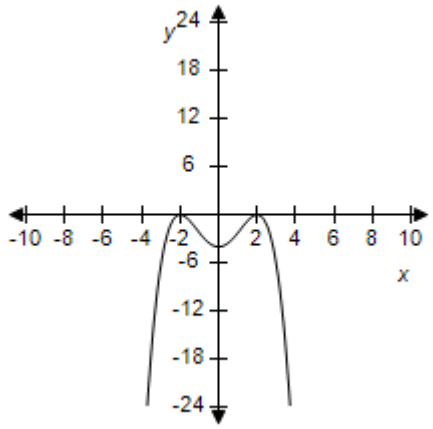
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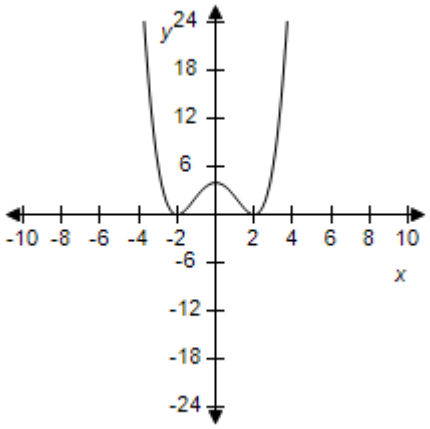




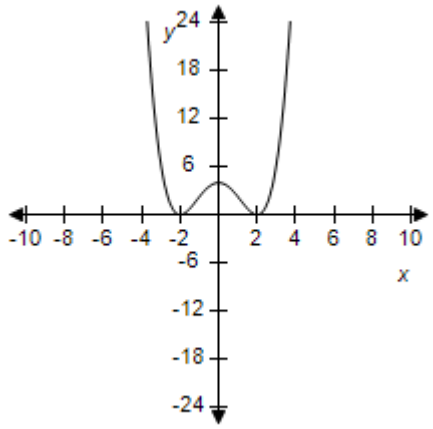
c. ± 2



d. 2



e. -2



ANSWER: c
POINTS: 1
REFERENCES: 3.2.87b

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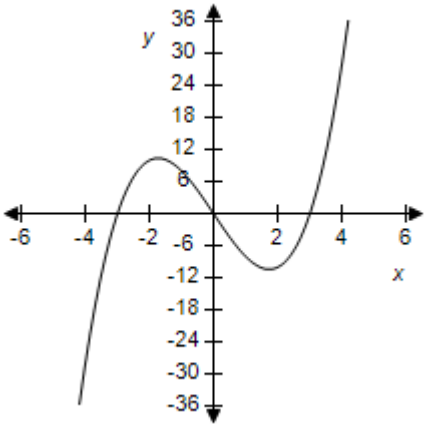
Section 2.2 - Polynomial Functions of Higher Degree

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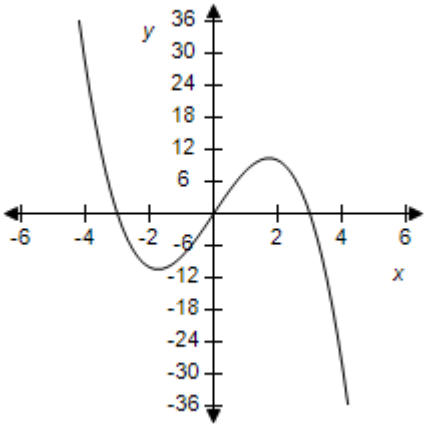
33. Select the graph of the function and use the zero or root feature to approximate the real zeros of the function.

$f(x) = x^3 - 9x$

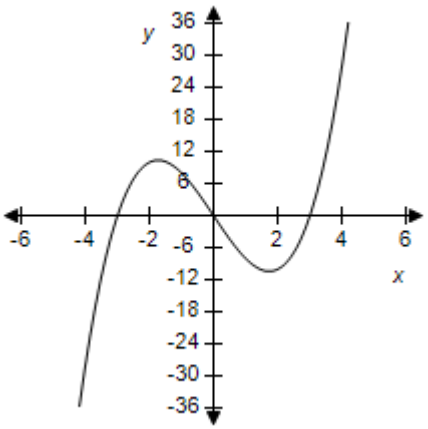
a. Zeros: $0, -3$



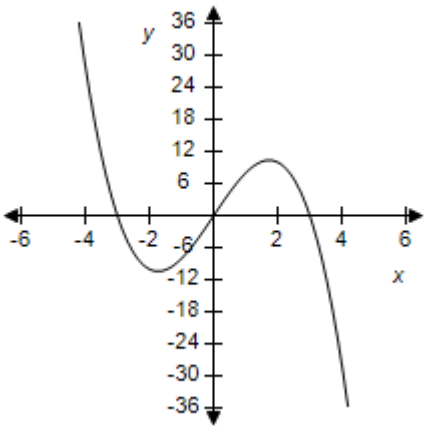
b. Zeros: $0, -3$



c. Zeros: $0, 3$

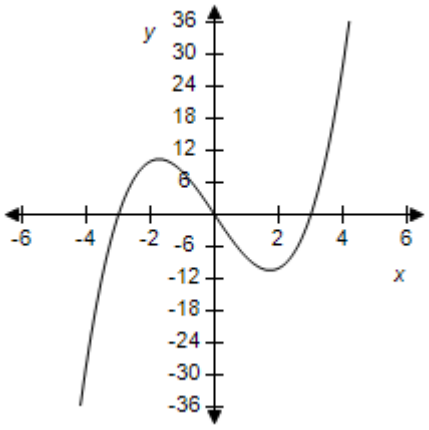


d. Zeros: $0, \pm 3$



e. Zeros: $0, \pm 3$

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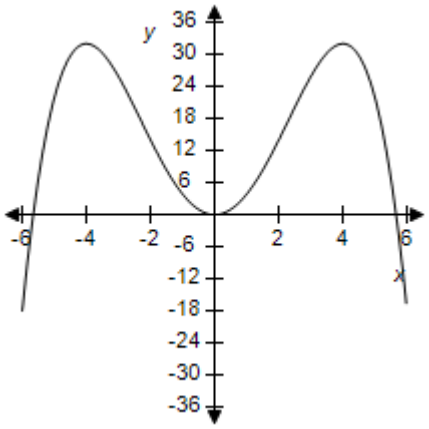


ANSWER: e
POINTS: 1
REFERENCES: 3.2.89
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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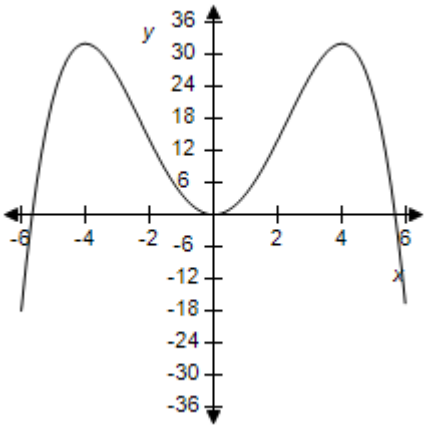
34. Select the graph of the function and use the zero or root feature to approximate the real zeros of the function.

$f(x) = \frac{1}{8}x^4 - 4x^2$

a. Zeros: $0, -4\sqrt{2}$



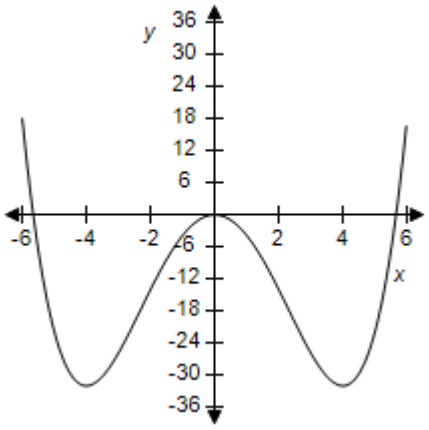
b. Zeros: $0, \pm 4\sqrt{2}$

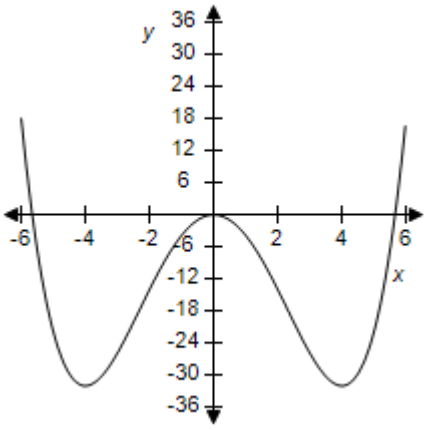


c. Zeros: $0, -4\sqrt{2}$

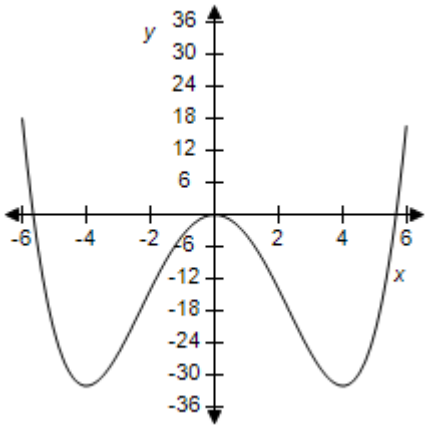
d. Zeros: $0, \pm 4\sqrt{2}$

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e. Zeros: $0, 4\sqrt{2}$



ANSWER: d
POINTS: 1
REFERENCES: 3.2.90
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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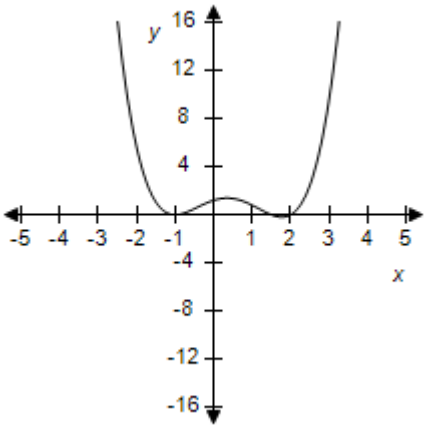
35. Select the graph of the function and use the zero or root feature to approximate the real zeros of the function.

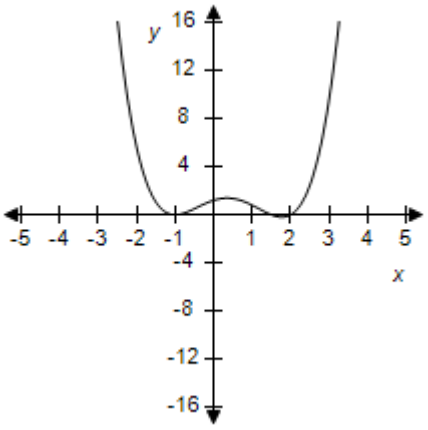
$$g(x) = \frac{1}{5}(x+1)^2(x-2)(2x-3)$$

a. Zeros: $-1, 2, \pm\frac{3}{2}$

b. Zeros: $-1, 2, -\frac{3}{2}$

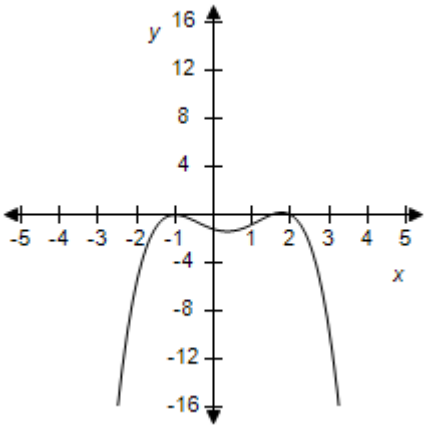
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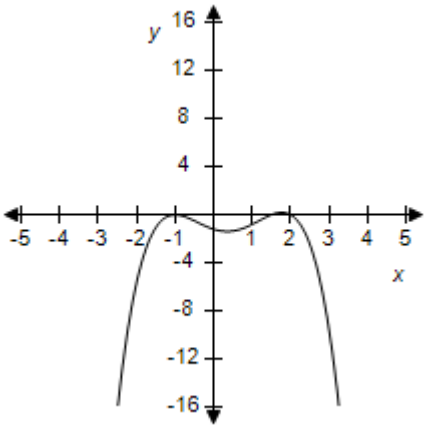
c.

Zeros: $-1, \pm 2, \frac{3}{2}$



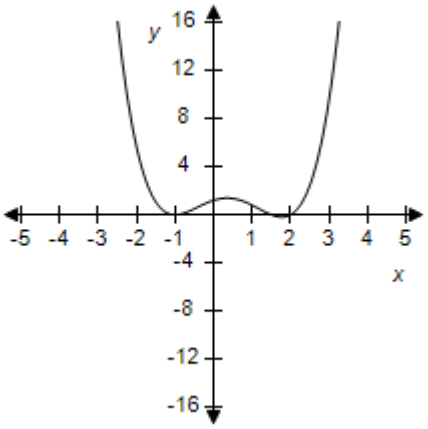
d.

Zeros: $-1, -2, \frac{3}{2}$



e.

Zeros: $-1, 2, \frac{3}{2}$



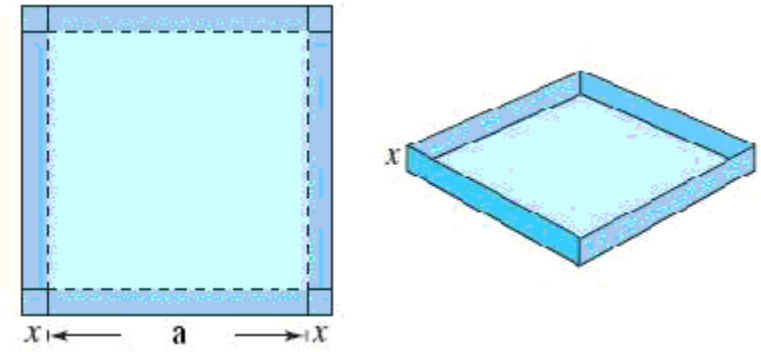
ANSWER: e

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Section 2.2 - Polynomial Functions of Higher Degree

POINTS: 1
REFERENCES: 3.2.91
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 10:43 AM

36. An open box is to be made from a square piece of material, 38 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure).



Here, $a = 38 - 2x$.
Determine the domain of the following function $V(x)$, representing the volume of the box .

$V(x) = x(38-2x)^2$

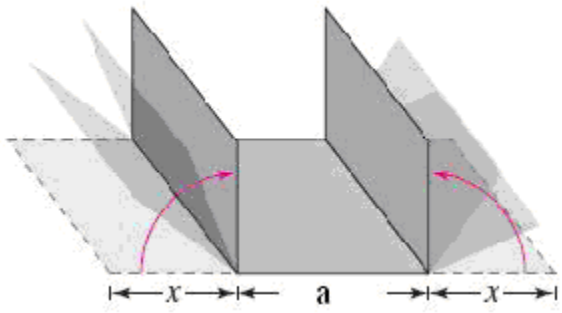
a. Domain: $0 < x \le 19$
b. Domain: $0 \le x \le 38$
c. Domain: $0 < x < 38$
d. Domain: $0 \le x \le 19$
e. Domain: $0 < x < 19$

ANSWER: e
POINTS: 1
REFERENCES: 3.2.97b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 10:45 AM

37. A roofing contractor is fabricating gutters from 10-cm aluminium sheeting. The contractor plans to use an aluminum siding folding press to create the gutter by creasing equal lengths for the sidewalls (see the figure).

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Here, $a = 10 - 2x$, where x represents the height of the sidewall of the gutter. Write a function A that represents the cross-sectional area of the gutter.

a. $A = -2x^2 + 10x$

b. $A = 10x^2 - 2x$

c. $A = -10x - 2x^2$

d. $A = 2x^2 - 10x$

e. $A = 2x^2 + 10x$

ANSWER:	a
POINTS:	1
REFERENCES:	3.2.99a
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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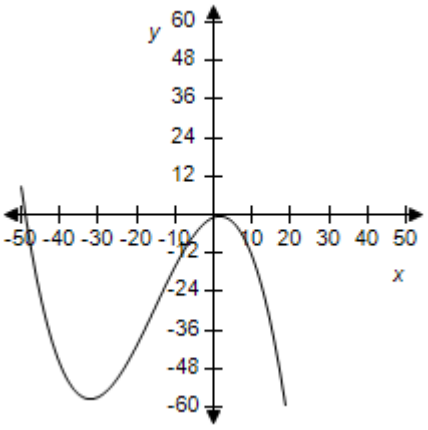
38. The growth of a red oak tree is approximated by the function

$G = -0.003t^3 + 0.137t^2 + 0.458t - 0.839$

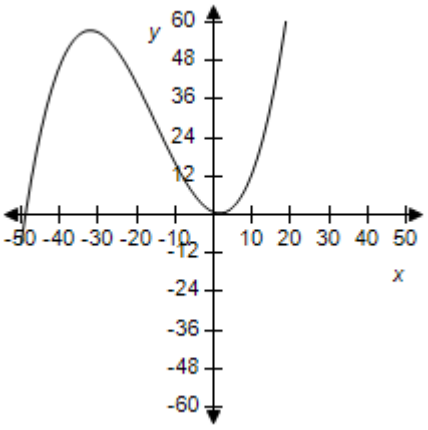
where G is the height of the tree (in feet) and t $(2 \le t \le 34)$ is its age (in years). Select the correct graph of the function.

a. b.

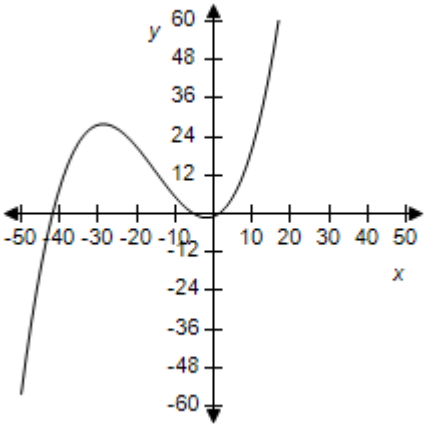
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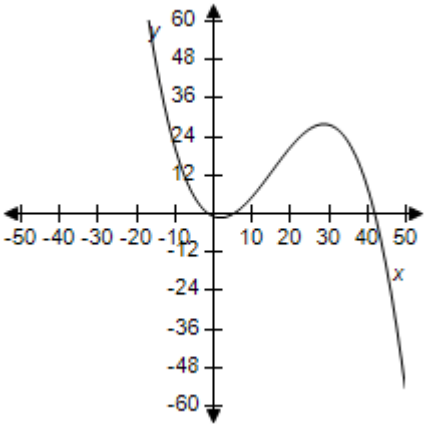
c.

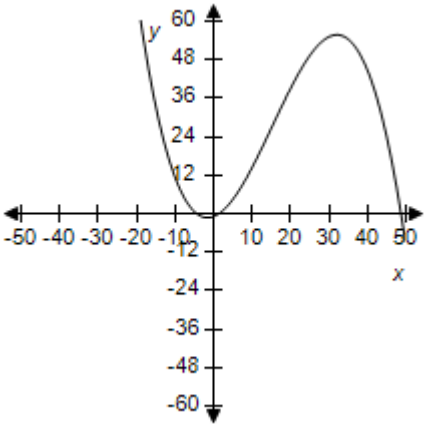


d.



e.





ANSWER: e
POINTS: 1
REFERENCES: 3.2.103a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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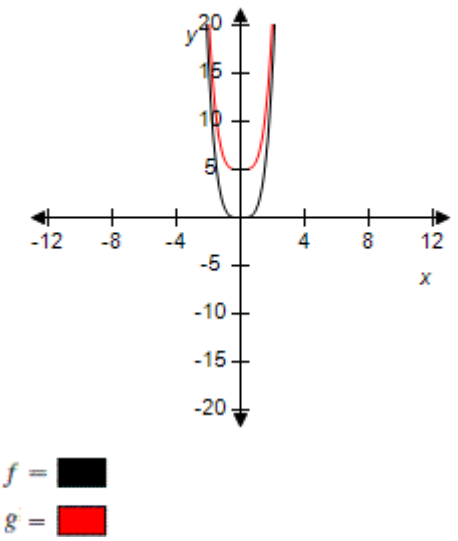
Section 2.2 - Polynomial Functions of Higher Degree

DATE MODIFIED: 5/28/2021 10:51 AM

39. Select the correct graph of the function given by $f(x)=x^4$. Explain how the graph of function g differs (if it does) from the graph of function f.

$g(x)=f(x)+5$

a.

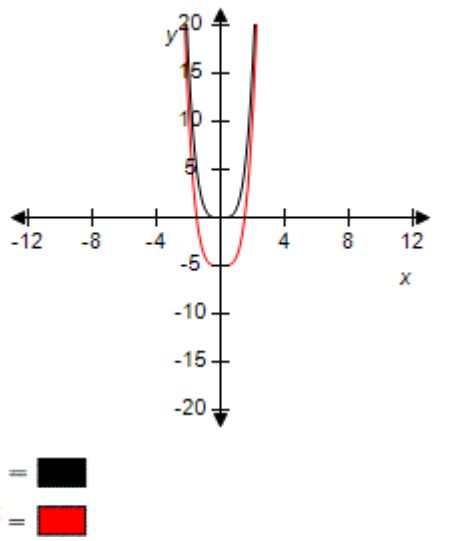


$f =$ ■

$g =$ ■

Vertical shift up 5 units.

b.

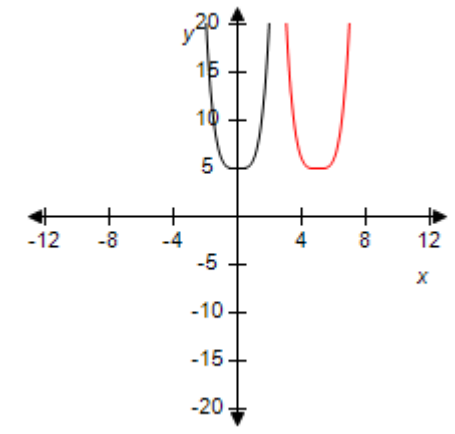


$f =$ ■

$g =$ ■

Vertical shift down 5 units.

c.

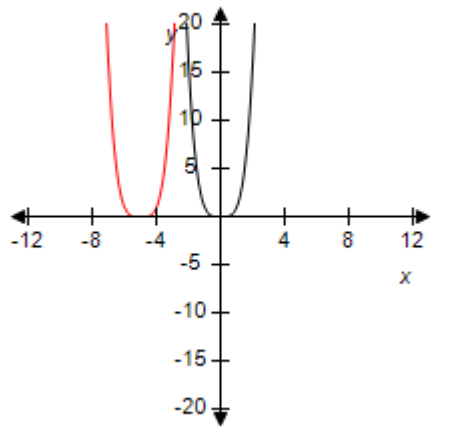


$f =$ ■

$g =$ ■

Horizontal shift right 5 units.

d.



$f =$ ■

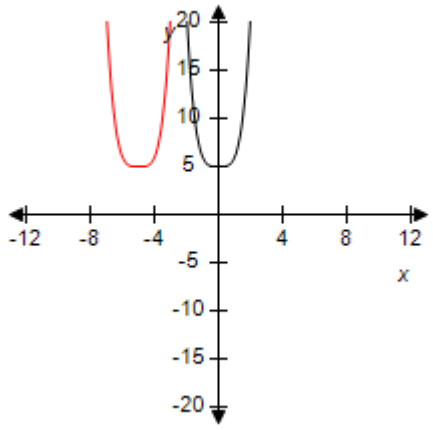
$g =$ ■

Horizontal shift left 5 units.

e.

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Section 2.2 - Polynomial Functions of Higher Degree



$f =$ ■

$g =$ ■

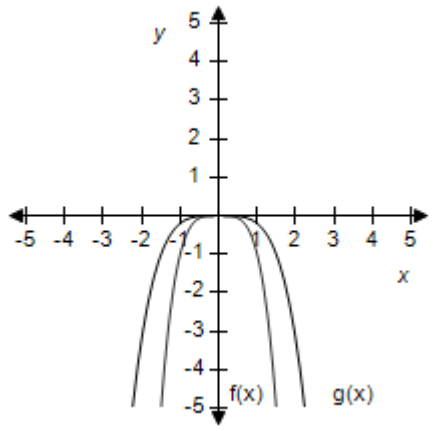
Horizontal shift left 5 units.

ANSWER: a
POINTS: 1
REFERENCES: 3.2.109a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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40. Select the correct graph of the function given by $f(x) = x^4$. Explain how the graph of function g differs (if it does) from the graph of function f.

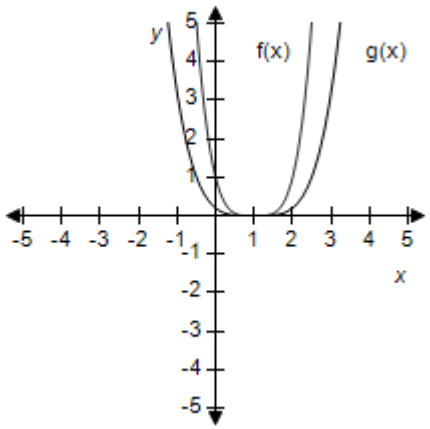
$$g(x) = \frac{1}{5}f(x)$$

a.



Horizontal stretch

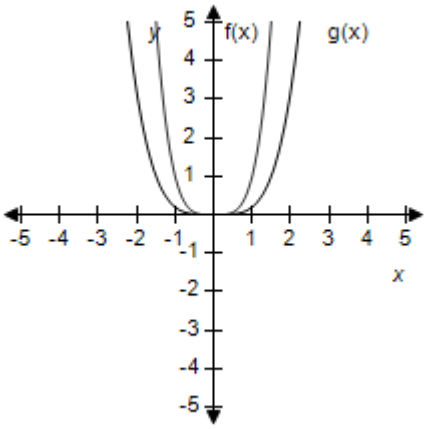
b.



Horizontal shrink

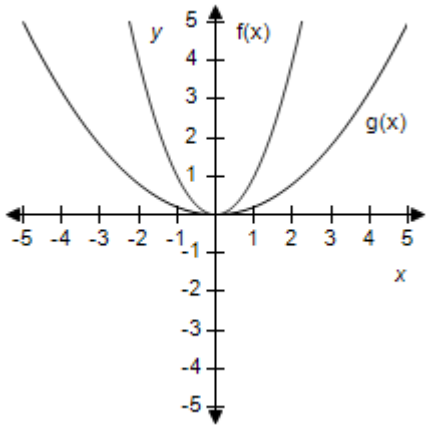
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c.



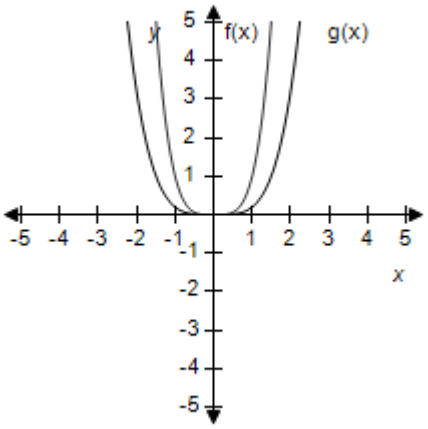
Horizontal shrink

d.



Vertical stretch

e.



Vertical shrink

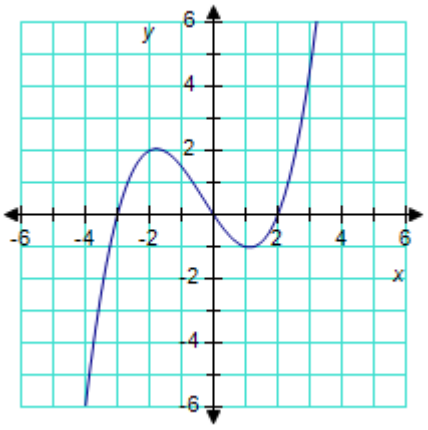
ANSWER: e
POINTS: 1
REFERENCES: 3.2.109f
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/28/2021 11:29 AM

41. Match the equation with its graph.

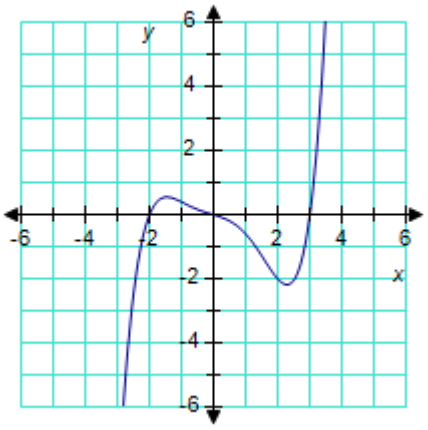
$$y = \frac{1}{20}\left(x^5 - x^4 - 5x^3 - x^2 - 6x\right)$$

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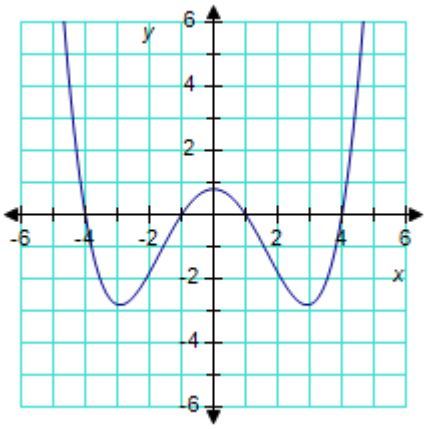
a.



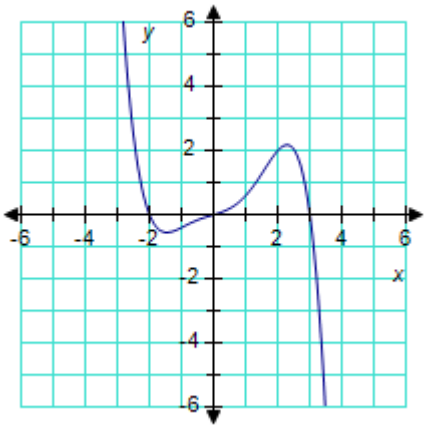
b.



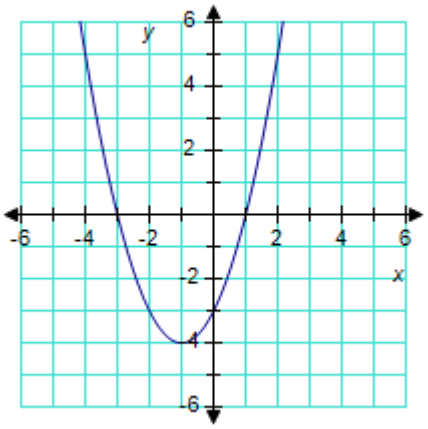
c.



d.



e.



ANSWER: b
POINTS: 1
REFERENCES: 3.2.16
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.147 - Match polynomial and graph
DATE CREATED: 6/10/2014 4:19 PM

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42. Describe the right-hand and the left-hand behavior of the graph of $q(x) = -5x^4 + 12x^3 + 13$.

a. Because the degree is even and the leading coefficient is negative, the graph falls to the left and rises to the right.
b. Because the degree is even and the leading coefficient is negative, the graph rises to the left and falls to the right.
c. Because the degree is even and the leading coefficient is negative, the graph falls to the left and falls to the right.
d. Because the degree is odd and the leading coefficient is negative, the graph rises to the left and rises to the right.
e. Because the degree is even and the leading coefficient is negative, the graph rises to the left and rises to the right.

ANSWER: c
POINTS: 1
REFERENCES: 3.2.22
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.148 - Determine right/left-hand behavior of polynomial
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/2/2014 8:59 AM

43. Describe the right-hand and the left-hand behavior of the graph of $s(x) = 3x^5 + 12x^3 + 3$.

a. Because the degree is odd and the leading coefficient is positive, the graph falls to the left and rises to the right.
b. Because the degree is odd and the leading and the second coefficient are positive, the graph rises to the left and rises to the right.
c. Because the degree is odd and the leading coefficient is positive, the graph falls to the left and falls to the right.
d. Because the degree is odd and the leading coefficient is positive, the graph rises to the left and falls to the right.
e. Because the degree is even and the leading coefficient is positive, the graph rises to the left and rises to the right.

ANSWER: a
POINTS: 1
REFERENCES: 3.2.26
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.148 - Determine right/left-hand behavior of polynomial
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DATE MODIFIED: 5/31/2021 2:06 AM

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44. Describe the right-hand and the left-hand behavior of the graph of $g(x) = -\frac{7}{12}(x^3 - x^2 + 2x + 1)$.

a. Because the degree is odd and the leading coefficient is negative, the graph rises to the left and falls to the right.
b. Because the degree is odd and the leading coefficient is negative, the graph falls to the left and rises to the right.
c. Because the degree is odd and the leading coefficient is positive, the graph falls to the left and falls to the right.
d. Because the degree is odd and the leading coefficient is positive, the graph rises to the left and rises to the right.
e. Because the degree is even and the leading coefficient is negative, the graph rises to the left and falls to the right.

ANSWER: a
POINTS: 1
REFERENCES: 3.2.29
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.148 - Determine right/left-hand behavior of polynomial
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/2/2014 9:06 AM

45. Find all real zeros of the polynomial $f(x) = x^3 + 5x^2 - 4x - 20$ and determine the multiplicity of each.

a. $x = -5$, multiplicity 2; $x = -2$, multiplicity 1
b. $x = -5$, multiplicity 3
c. $x = 2$, multiplicity 1; $x = -2$, multiplicity 1; $x = -5$, multiplicity 1
d. $x = -2$, multiplicity 1; $x = 5$, multiplicity 1; $x = -5$, multiplicity 1
e. $x = 2$, multiplicity 2; $x = -5$, multiplicity 1

ANSWER: c
POINTS: 1
REFERENCES: 3.2.41
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.149 - Determine zeros and multiplicity
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/2/2014 9:16 AM

46. Find all real zeros of the polynomial $f(x) = x^4 + 10x^3 + 24x^2$ and determine the multiplicity of each.

a. $x = 0$, multiplicity 1; $x = 6$, multiplicity 1; $x = -6$, multiplicity 1; $x = 4$, multiplicity 1
b. $x = 0$, multiplicity 2; $x = 6$, multiplicity 1; $x = 4$, multiplicity 1

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c. $x = 0$, multiplicity 2; $x = -6$, multiplicity 1; $x = -4$, multiplicity 1

d. $x = 6$, multiplicity 2; $x = 4$, multiplicity 2

e. $x = 0$, multiplicity 1; $x = -6$, multiplicity 2; $x = 4$, multiplicity 1

ANSWER: c
POINTS: 1
REFERENCES: 3.2.44
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.149 - Determine zeros and multiplicity
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/31/2021 2:14 AM

47. Find all real zeros of the polynomial $f(x) = x^4 - 61x^2 + 900$ and determine the multiplicity of each.

a. $x = -5$, multiplicity 2; $x = -6$, multiplicity 2

b. $x = 25$, multiplicity 2; $x = 36$, multiplicity 2

c. $x = 5$, multiplicity 2; $x = 6$, multiplicity 2

d. $x = 25$, multiplicity 2; $x = 6$, multiplicity 2

e. $x = 5$, multiplicity 1; $x = -5$, multiplicity 1; $x = 6$, multiplicity 1; $x = -6$, multiplicity 1

ANSWER: e
POINTS: 1
REFERENCES: 3.2.47
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.149 - Determine zeros and multiplicity
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/14/2015 10:03 AM

48. Using a graphing utility, graph $f(x) = x^3 - 4x$ and approximate the zeros and their multiplicity.

a. $x = 0$, multiplicity 2; $x = -2$, multiplicity 1

b. $x = 0$, multiplicity 1; $x = 2$, multiplicity 1; $x = -2$, multiplicity 1

c. $x = 0$, multiplicity 3

d. $x = 0$, multiplicity 1; $x = 2$, multiplicity 2

e. $x = 2$, multiplicity 2; $x = -2$, multiplicity 1

ANSWER: b
POINTS: 1
REFERENCES: 3.2.75
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

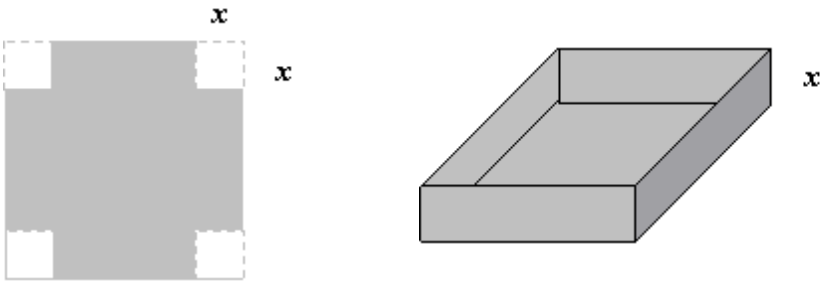
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Section 2.2 - Polynomial Functions of Higher Degree

LEARNING OBJECTIVES: PREC.LARS.16.150 - Approximate roots with graphing utility
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 1:46 AM

49. An open box is to be made from a square piece of cardboard, 33 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure below). Determine the function V in terms of x that represents the volume of the box.



a. $V(x) = -4x^3 + 66x^2 - 33x$

b. $V(x) = -2x^3 + 33x^2$

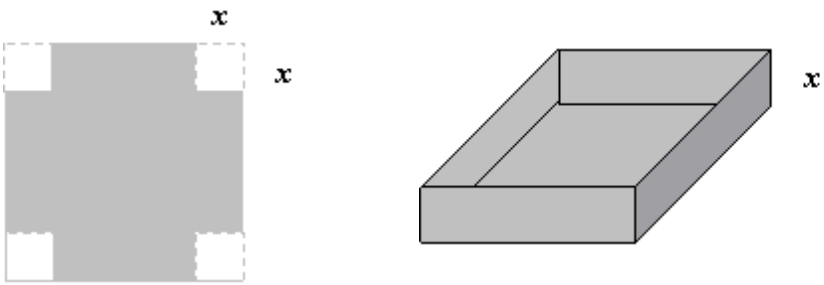
c. $V(x) = 4x^3 - 132x^2 + 1089x$

d. $V(x) = -4x^3 + 66x^2$

e. $V(x) = 4x^3 - 66x^2 + 33x$

ANSWER: c
POINTS: 1
REFERENCES: 3.2.97a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.151 - Application: Polynomials
DATE CREATED: 6/10/2014 4:19 PM
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50. An open box is to be made from a square piece of cardboard, 22 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure below). If the volume of the box is represented by $V(x) = x(22-2x)^2$, determine the domain of $V(x)$.



a. $D = \{x \mid 0 < x < 22\}$

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b. $D = \{x \mid 0 < x < 11\}$

c. $D = \{x \mid x > 0\}$

d. $D = \{x \mid 44 < x < 88\}$

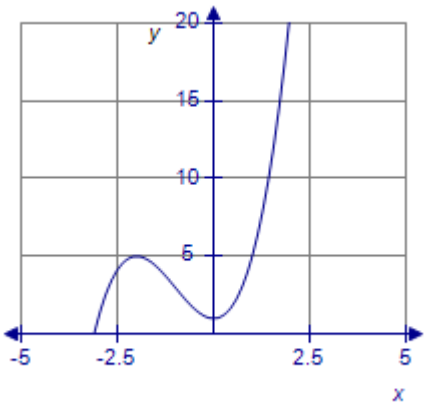
e. $D = \{x \mid 11 < x < 22\}$

ANSWER: b
POINTS: 1
REFERENCES: 3.2.97b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.151 - Application: Polynomials
DATE CREATED: 6/10/2014 4:19 PM
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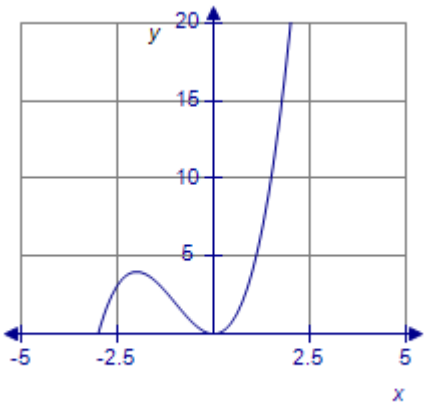
51. Graph the polynomial function.

$y = x^3 + 3x^2$

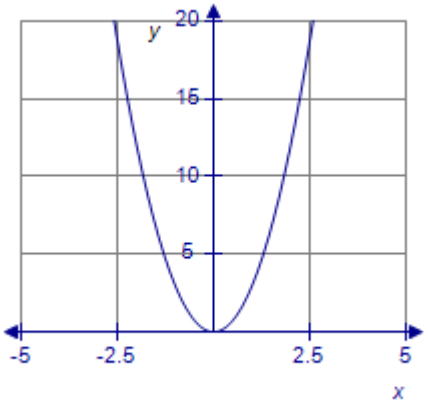
a.



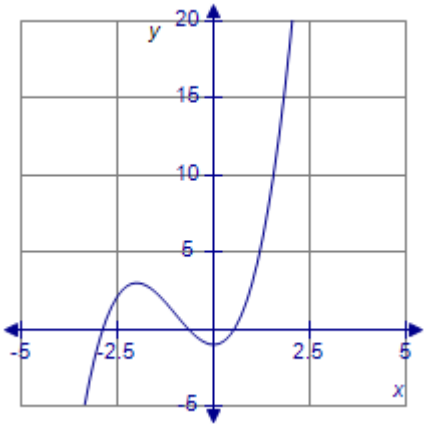
b.



c.



d.



ANSWER: b

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Section 2.2 - Polynomial Functions of Higher Degree

POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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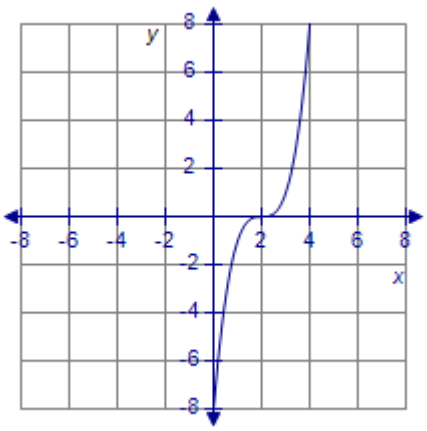
52. Tell whether the function $y = x^5 + 9x^3$ is even or odd. If it is neither, indicate so.

a. even
b. odd
c. neither

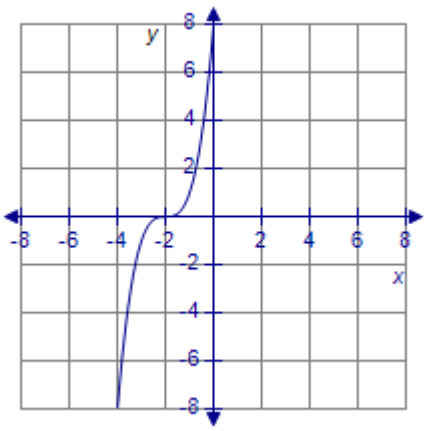
ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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53. The graph of the function $g(x)$ is a translation of the graph of $f(x) = x^3$. Graph the function $g(x) = (x - 2)^3$.

a.



b.

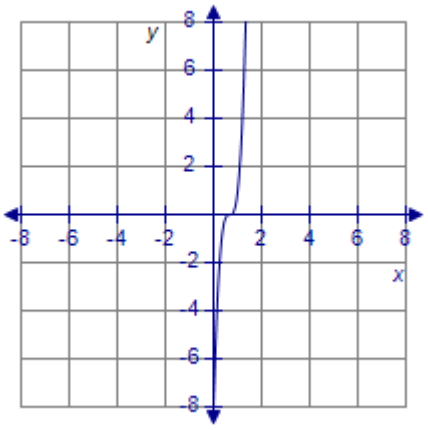


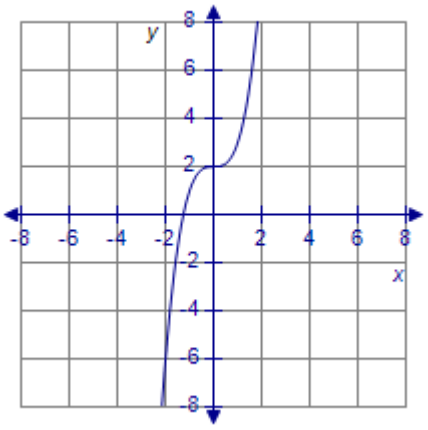
c.

d.

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Section 2.2 - Polynomial Functions of Higher Degree



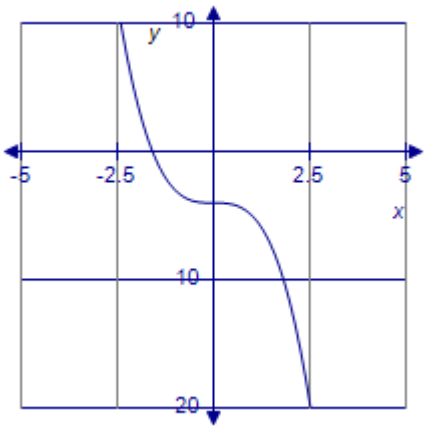


ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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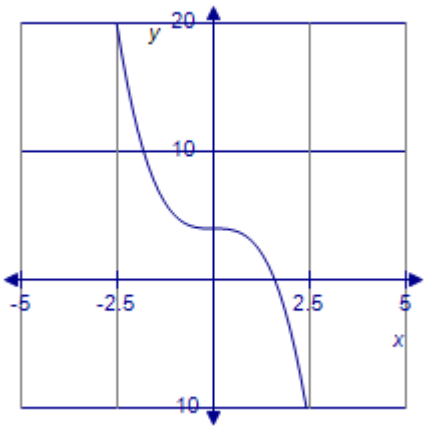
54. Graph the polynomial function.

$y = -x^3 + 4$

a.

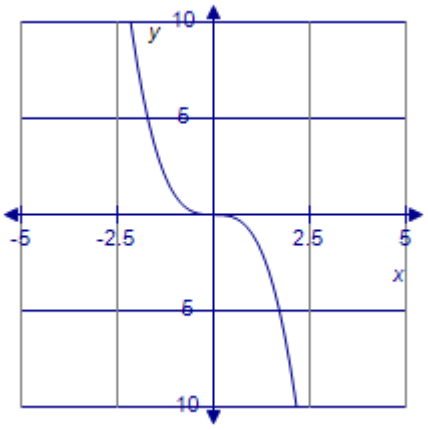


b.

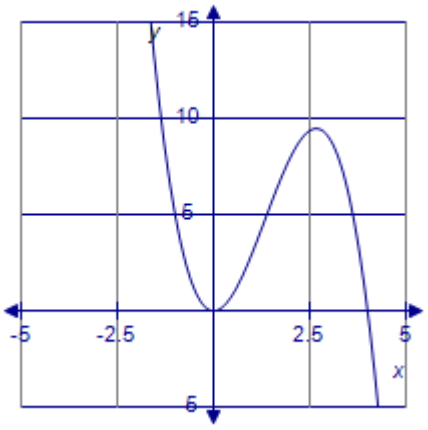


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c.



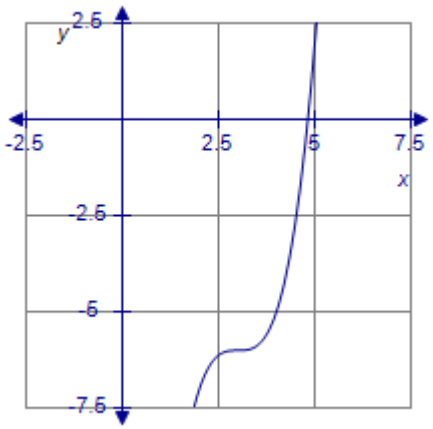
d.



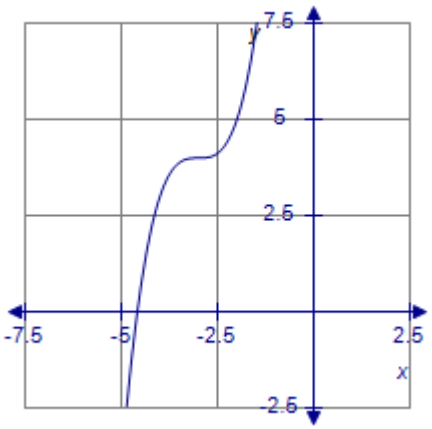
ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/31/2021 2:31 AM

55. The graph of the function $g(x)$ is a translation of the graph of $f(x) = x^3$. Graph the function $g(x) = (x - 3)^3 - 4$.

a.

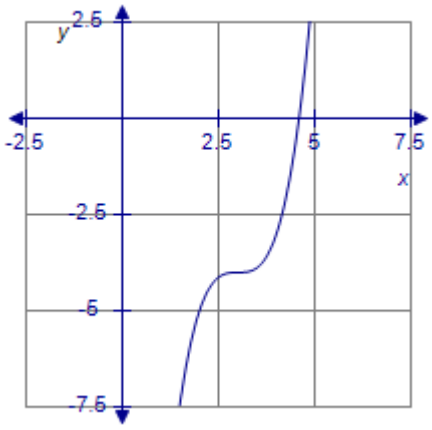


b.

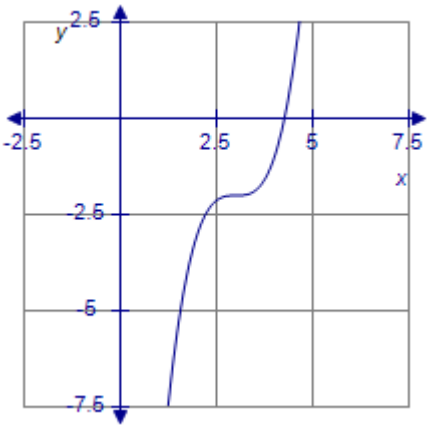


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c.



d.



ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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56. Find all real zeros of the polynomial $f(x) = x^3 - x^2 - 9x + 9$ and determine the multiplicity of each.

a. $x = 3$, multiplicity 2; $x = 1$, multiplicity 1
b. $x = 3$, multiplicity 1; $x = -3$, multiplicity 1; $x = 1$, multiplicity 1
c. $x = 1$, multiplicity 2; $x = -3$, multiplicity 1
d. $x = -3$, multiplicity 1; $x = -1$, multiplicity 1; $x = 1$, multiplicity 1
e. $x = 1$, multiplicity 3

ANSWER: b
POINTS: 1
REFERENCES: 90
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.149 - Determine zeros and multiplicity
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DATE MODIFIED: 5/31/2021 2:44 AM

57. Find all real zeros of the polynomial $f(x) = x^4 + 7x^3 + 6x^2$ and determine the multiplicity of each.

a. $x = 0$, multiplicity 2; $x = -1$, multiplicity 1; $x = -6$, multiplicity 1
b. $x = 1$, multiplicity 2; $x = 6$, multiplicity 2
c. $x = 0$, multiplicity 2; $x = 1$, multiplicity 1; $x = 6$, multiplicity 1
d. $x = -1$, multiplicity 2; $x = -6$, multiplicity 2

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e. $x = 0$, multiplicity 1; $x = 1$, multiplicity 1; $x = -1$, multiplicity 1; $x = 6$, multiplicity 1

ANSWER: a
POINTS: 1
REFERENCES: 92
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.149 - Determine zeros and multiplicity
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58. Using a graphing utility, graph $f(x) = x^5 - 8x^4 + 16x^3$ and approximate the zeros and their multiplicity.

a. $x = 0$, multiplicity 2; $x = 4$, multiplicity 3
b. $x = 0$, multiplicity 1; $x = 4$, multiplicity 2; $x = -4$, multiplicity 2
c. $x = 0$, multiplicity 3; $x = 4$, multiplicity 2
d. $x = 0$, multiplicity 3; $x = -4$, multiplicity 2
e. $x = 0$, multiplicity 2; $x = 4$, multiplicity 2; $x = -4$, multiplicity 1

ANSWER: c
POINTS: 1
REFERENCES: 94
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.150 - Approximate roots with graphing utility
DATE CREATED: 6/10/2014 4:19 PM
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59. Find a polynomial with the given zeros.

7, 1

a. $x^2 - 8x + 7$
b. $x^2 - 8x + 8$
c. $x^2 - 8x - 7$
d. $8x^2 - x + 7$
e. none of these

ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.2 - Polynomial Functions of Higher Degree

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60. Find a polynomial with the given zeros.

$1, 1, 7$

a. $9x^2 + 15x - 7$

b. $x^3 + 9x^2 - 15x + 7$

c. $15x^3 - 9x^2 + 15x - 7$

d. $x^3 - 9x^2 + 15x - 7$

e. none of these

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 4:40 AM

61. Find a polynomial with the given zeros.

$-1, 5, -\sqrt{7}, \sqrt{7}$

a. $x^5 - 4x^4 - 12x^3 + 28x^2 + 35x - 2$

b. $x^4 - 12x^2 + 35$

c. $x^4 - 12x^3 - 4x^2 - 28x + 35$

d. $x^4 - 4x^3 - 12x^2 + 28x + 35$

e. none of these

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 10/3/2014 4:50 AM

62. Find a polynomial with the given zeros.

$0, 0, 0, \sqrt{3}, -\sqrt{3}$

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a. $x^5 - 3x^3$

b. $x^5 - 6x^3$

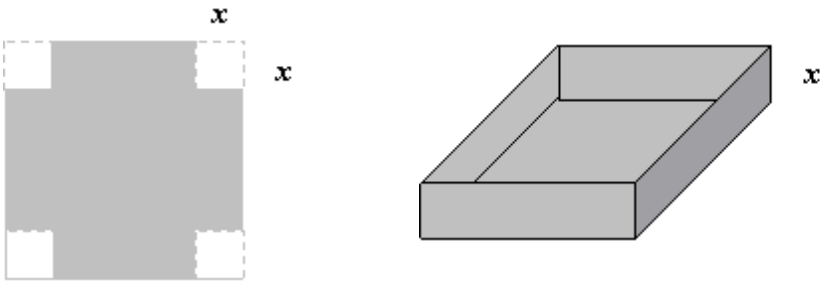
c. $x^5 - x^3 + 3$

d. $x^2 + 3x + 6$

e. none of these

ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/3/2014 4:55 AM

63. An open box is to be made from a square piece of cardboard, 28 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure below). Determine the function V in terms of x that represents the volume of the box.



a. $V(x) = -2x^3 + 28x^2$

b. $V(x) = -4x^3 + 56x^2$

c. $V(x) = 4x^3 - 56x^2 + 28x$

d. $V(x) = -4x^3 + 56x^2 - 28x$

e. $V(x) = 4x^3 - 112x^2 + 784x$

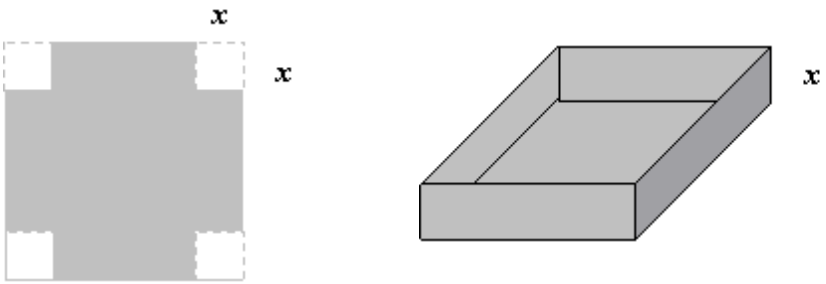
ANSWER: e
POINTS: 1
REFERENCES: 95
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.151 - Application: Polynomials
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Section 2.2 - Polynomial Functions of Higher Degree

64. An open box is to be made from a square piece of cardboard, 24 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure below). If the volume of the box is represented by $V(x) = x(24-2x)^2$, determine the domain of $V(x)$.



a. $D = \{x \mid x > 0\}$

b. $D = \{x \mid 0 < x < 12\}$

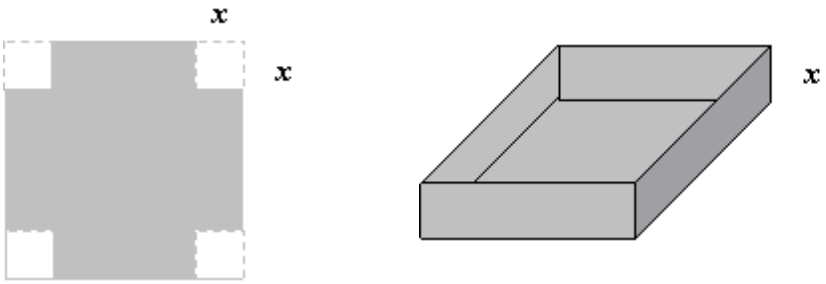
c. $D = \{x \mid 48 < x < 96\}$

d. $D = \{x \mid 0 < x < 24\}$

e. $D = \{x \mid 12 < x < 24\}$

ANSWER:	b
POINTS:	1
REFERENCES:	96
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
LEARNING OBJECTIVES:	PREC.LARS.16.151 - Application: Polynomials
DATE CREATED:	6/10/2014 4:19 PM
DATE MODIFIED:	5/31/2021 2:48 AM

65. An open box is to be made from a square piece of cardboard, 72 cm on a side, by cutting equal squares with sides of length x from the corners and turning up the sides (see the figure below). After determining the function V in terms of x that represents the volume of the box, use a graphing utility to estimate the dimensions that will maximize its volume.



a. 24 cm x 24 cm x 12 cm

b. 48 cm x 48 cm x 12 cm

c. 48 cm x 48 cm x 24 cm

d. 36 cm x 36 cm x 24 cm

e. 12 cm x 12 cm x 6 cm

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Section 2.2 - Polynomial Functions of Higher Degree

ANSWER:	b
POINTS:	1
REFERENCES:	140
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
LEARNING OBJECTIVES:	PREC.LARS.16.151 - Application: Polynomials
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Section 2.3 - Polynomial and Synthetic Division

1. Use the Remainder Theorem and synthetic division to find the function value.

$g(x) = 2x^6 + 9x^4 - 9x^2 + 4, \quad g(0)$

a. 4
b. 1
c. –2
d. 6
e. 5

ANSWER: a
POINTS: 1
REFERENCES: 3.3.56c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:18 AM

2. Use long division to divide.

$(x^4 + 7x^3 + 10x^2 - x - 2) \div (x + 2)$

a. $x^3 + 5x^2 + 1$
b. $x^3 - 5x^2 - 1$
c. $x^3 + 5x^2 - 1$
d. $x^2 + 5x - 1$
e. $x^3 - 5x^2 + 1$

ANSWER: c
POINTS: 1
REFERENCES: 3.3.15
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/2/2014 4:34 AM

3. Use long division to divide.

$(4x + 2) \div (2x + 1)$

a. 4
b. 2

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c. –2
d. 1
e. 3

ANSWER: b
POINTS: 1
REFERENCES: 3.3.20
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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4. Find the value of k such that x - 6 is a factor of $x^3 - kx^2 + 2kx - 24$.

a. $k = 6$
b. $k = 10$
c. $k = 8$
d. $k = 7$
e. $k = 9$

ANSWER: c
POINTS: 1
REFERENCES: 3.3.97
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:20 AM

5. Use the Remainder Theorem and synthetic division to find the function value. Verify your answers using another method.

$h(x) = x^3 - 2x^2 - 5x + 6, \quad h(-8)$

a. –594
b. –592
c. –596
d. –593
e. –590

ANSWER: a
POINTS: 1
REFERENCES: 3.3.57c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.3 - Polynomial and Synthetic Division

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6. Determine whether the statement is true or false. Justify your answer.

If $(9x + 2)$ is a factor of some polynomial function f, then $\frac{2}{9}$ is a zero of f.

a. True. $\frac{2}{9}$ is a zero of f.

b. False. $-\frac{2}{9}$ is a zero of f.

ANSWER: b
POINTS: 1
REFERENCES: 3.3.87
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:25 AM

7. Determine whether the statement is true or false. Justify your answer.

The rational expression

$$\frac{x^4+2x^2-12x+12}{x^3-5x-15}$$

is improper.

a. True. The degree of the numerator is greater than the degree of the denominator.
b. False. The degree of the denominator is smaller than the degree of the numerator.

ANSWER: a
POINTS: 1
REFERENCES: 3.3.89
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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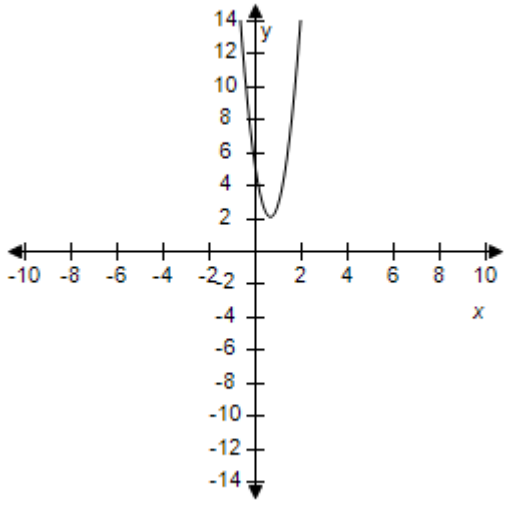
8. Select the correct graph of the following function.

$f(x) = 6x^3 + x^2 - 9x + 5$

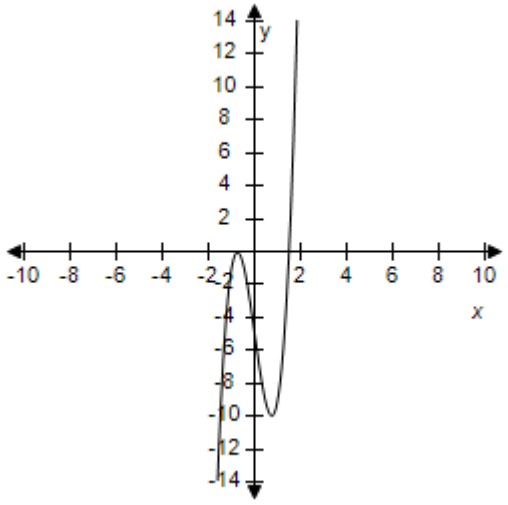
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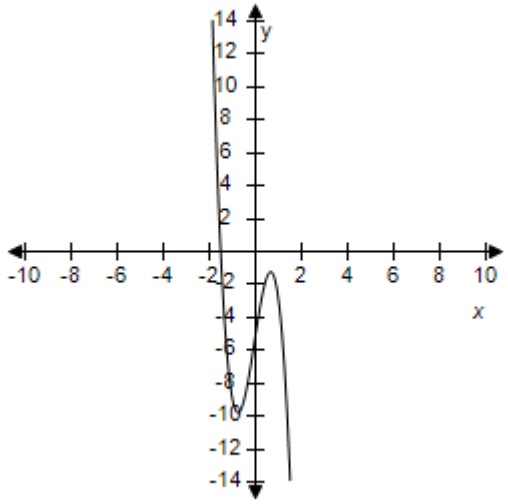
a.



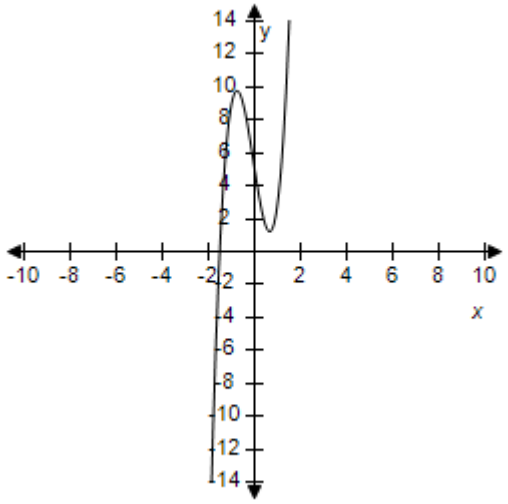
b.



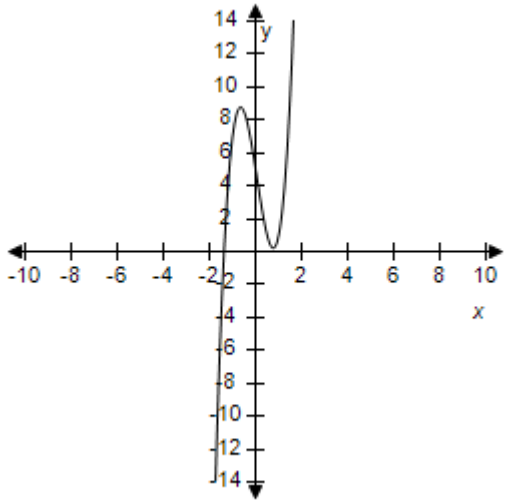
c.



d.



e.



ANSWER: d

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Section 2.3 - Polynomial and Synthetic Division

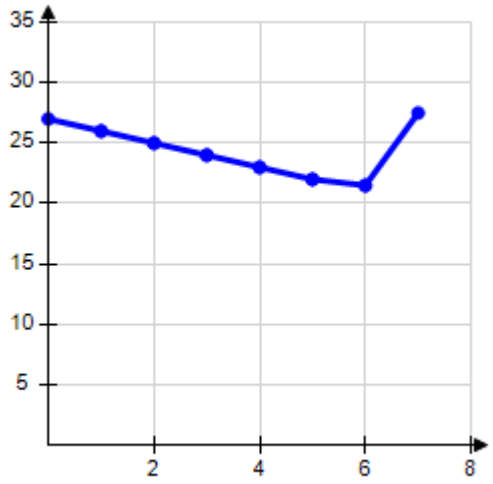
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HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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9. The amounts A (in billions of dollars) donated to support higher education in the United States from 2000 through 2007 are shown in the table, where t represents the year, with $t = 0$ corresponding to 2000.

Year, t	Amount, A
0	23.3
1	24.3
2	24
3	24
4	24.5
5	25.7
6	28.1
7	29.9

Use a graphing utility to select a correct scatter plot of the above data.

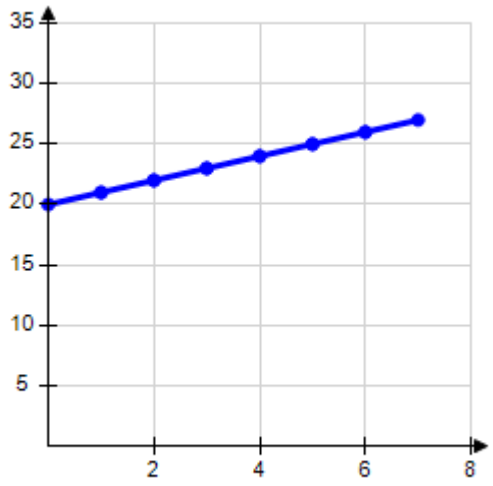
a.



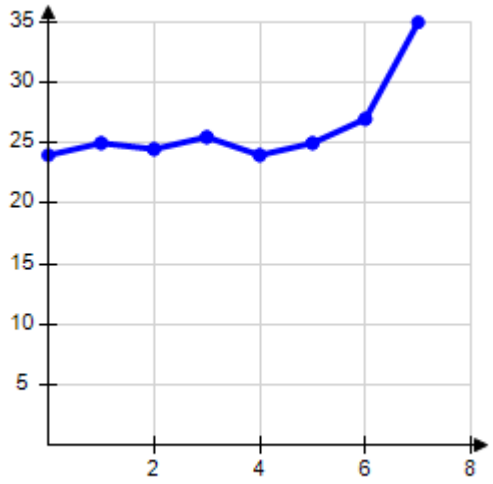
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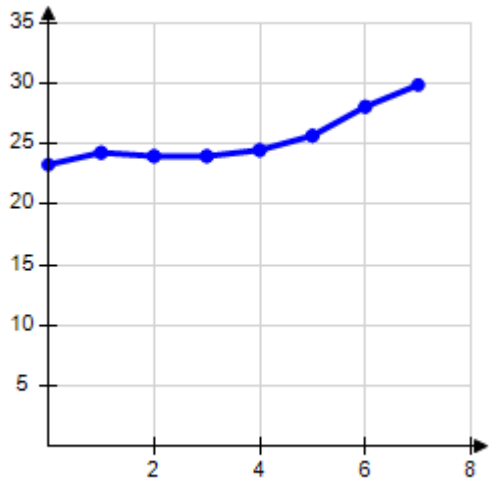
b.



c.

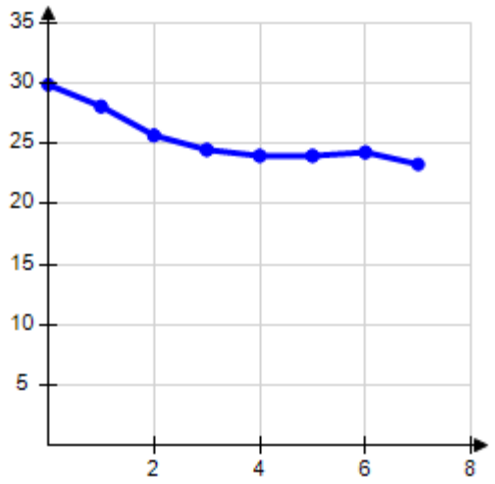


d.



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e.

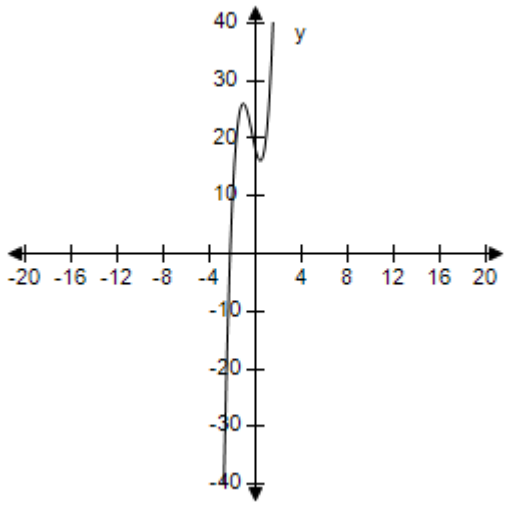


ANSWER: d
POINTS: 1
REFERENCES: 3.3.85a
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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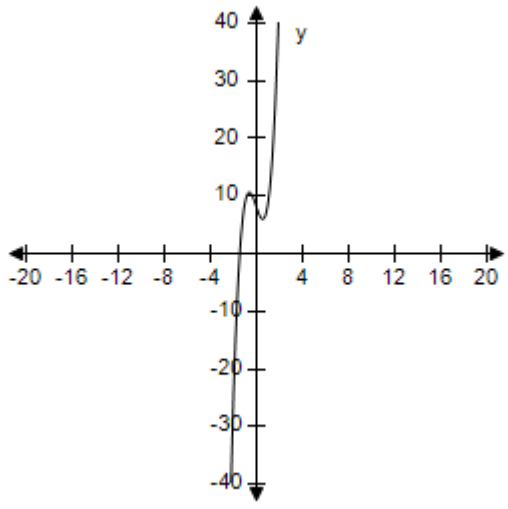
10. Select the correct graph of the following function.

$f(x) = 6x^3 + 6x^2 - 8x + 18$

a.

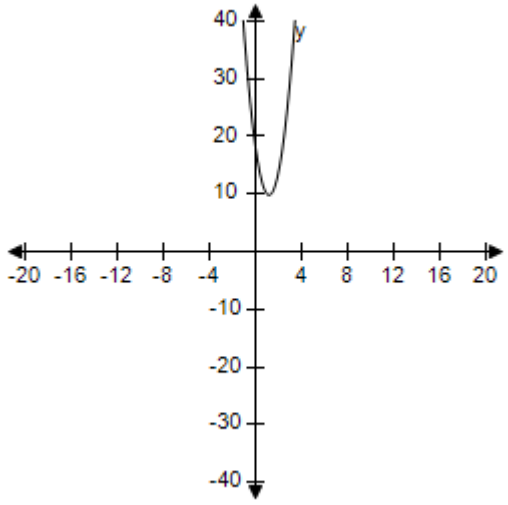


b.

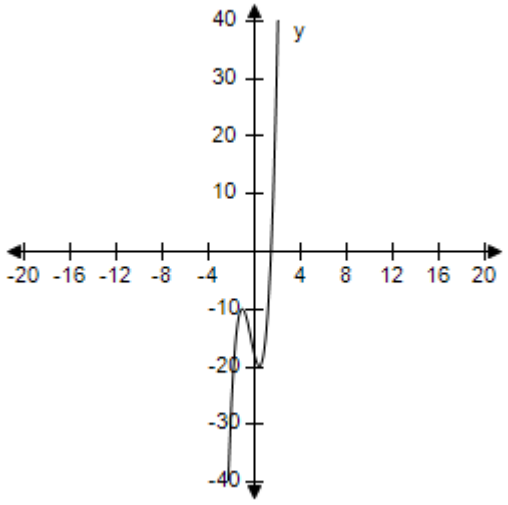


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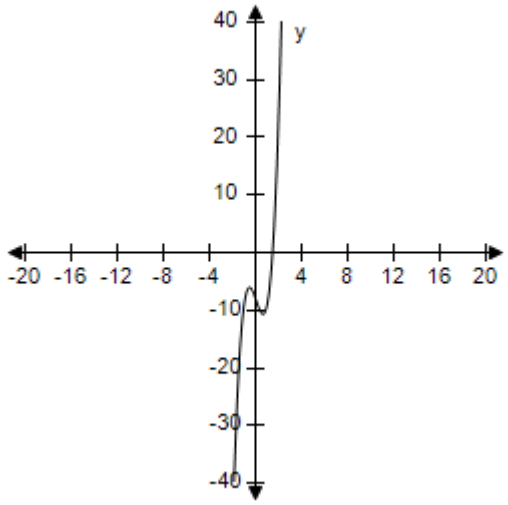
c.



d.



e.



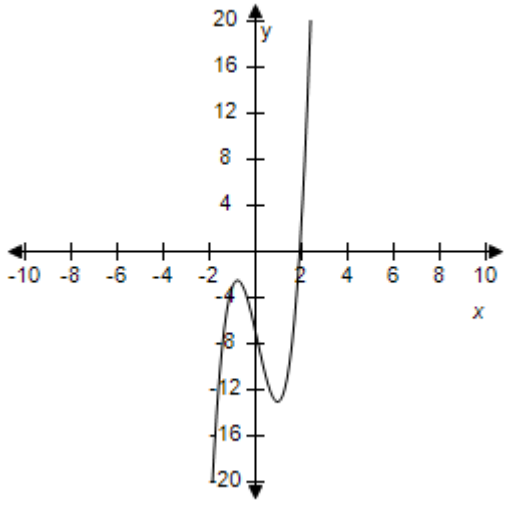
ANSWER: a
POINTS: 1
REFERENCES: 3.3.68e
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:36 AM

11. Select the correct graph of the following function.

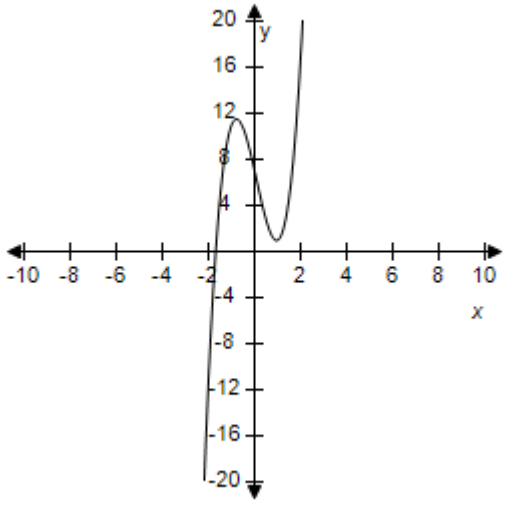
$f(x) = 4x^3 - x^2 - 9x + 7$

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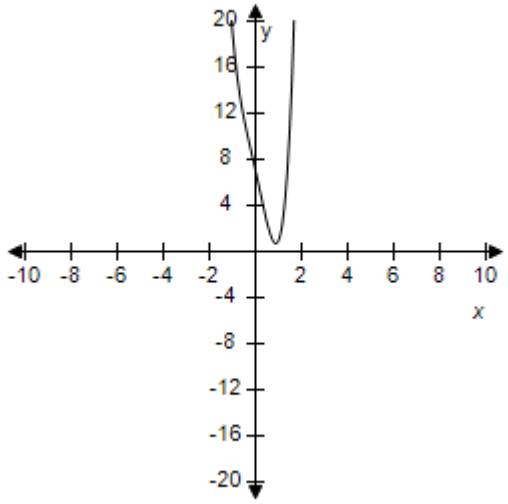
a.



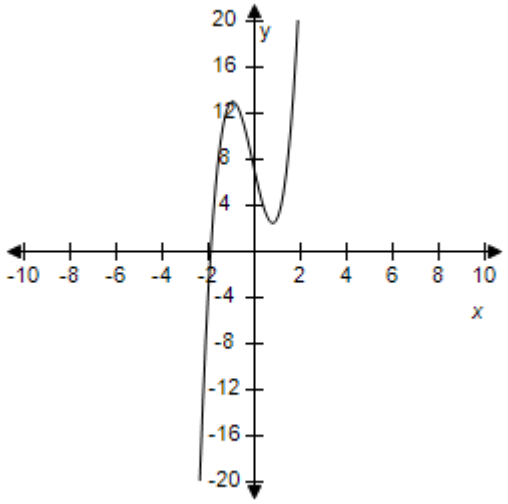
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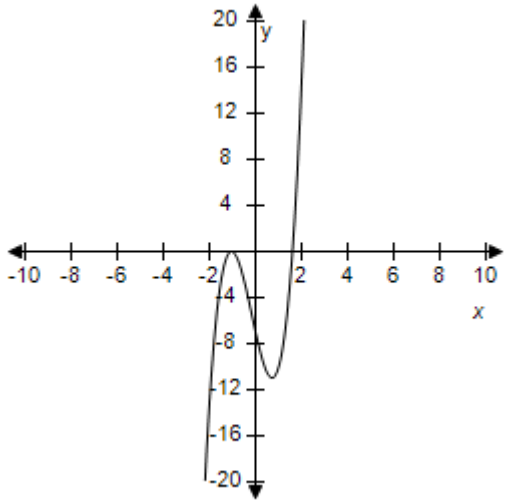
c.



d.



e.



ANSWER: b

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Section 2.3 - Polynomial and Synthetic Division

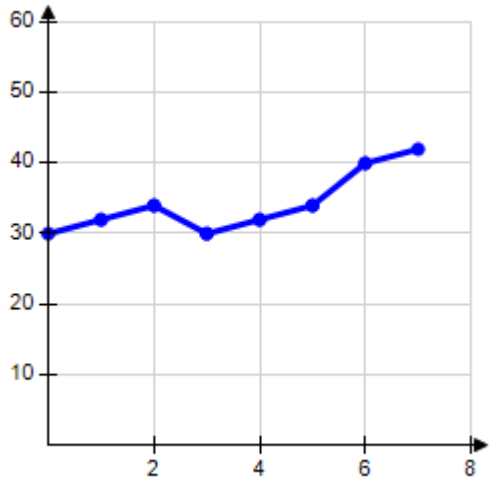
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REFERENCES: 3.3.73e
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:48 AM

12. The amounts A (in billions of dollars) donated to support higher education in the United States from 2000 through 2007 are shown in the table, where t represents the year, with $t = 0$ corresponding to 2000.

Year, t	Amount, A
0	30.6
1	32.3
2	34.3
3	57.7
4	38.1
5	42.8
6	48
7	52.8

Use a graphing utility to create a scatter plot of the data.

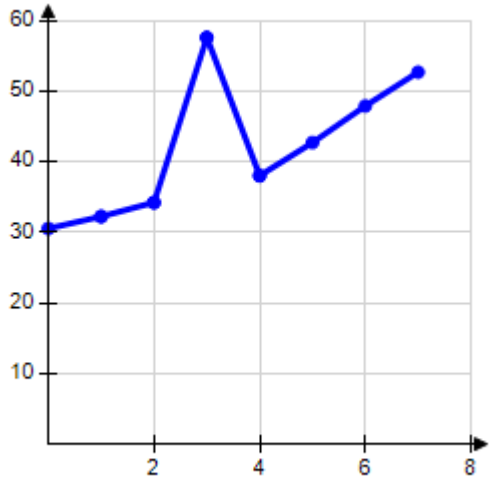
a.



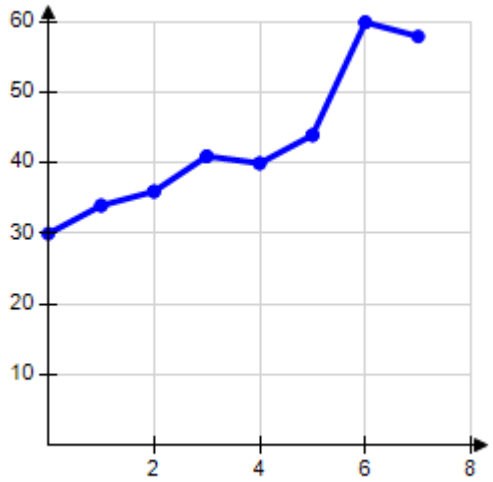
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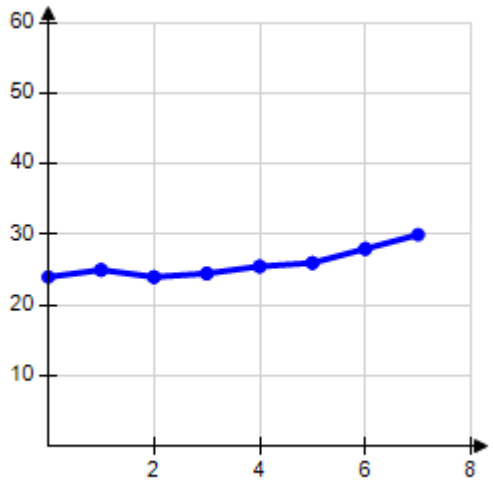
b.



c.

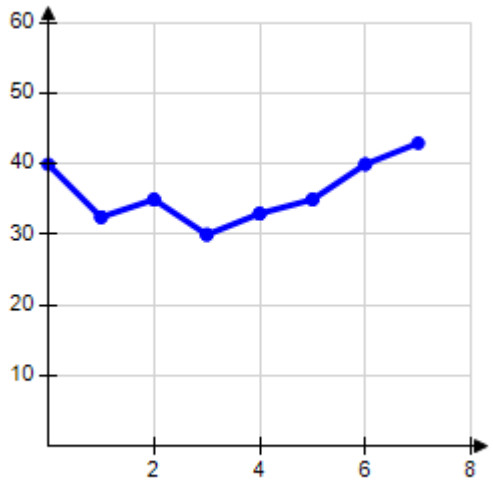


d.



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e.



ANSWER: b
POINTS: 1
REFERENCES: 3.3.86a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 10:51 AM

13. Use long division to divide.

$(x^3+4x^2+x+4)\div(x+4)$

a. x^2+1

b. $x^2+8x+33-\frac{129}{x+4}$

c. x^2-4

d. $x^2+8x+33+\frac{120}{x+4}$

e. $x^2+8x+33$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.16
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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14. Use long division to divide.

$(x^3+64)\div(x+4)$

a. $x^2-4x+16$

b. $x^2+4x-16$

c. x^2+16

d. x^2-16

e. $x^2-16+\frac{4}{x+4}$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.18
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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15. Use long division to divide.

$(x^4-4x^2-2)\div(x^2+x-4)$

a. $x^2-x+1-\frac{4}{x^2-x+1}$

b. $x^2-x+1+\frac{-5x+2}{x^2+x-4}$

c. x^2-x+1

d. x^2+x-1

e. $x^2+x-1+\frac{-5x-4}{x^2+x-4}$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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16. Use synthetic division to divide.

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Section 2.3 - Polynomial and Synthetic Division

$(4x^3 + 11x^2 - 43x + 10) \div (x + 5)$

a. $4x^2 - 11x - 5$

b. $4x^2 - 9x + 2$

c. $4x^2 - 3x - 10$

d. $4x^2 + 19x - 4$

e. $4x^2 + 6x - 8$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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17. Use synthetic division to divide.

$(12 + 5x^3 - 11x - 18x^2) \div (x - 4)$

a. $5x^2 + 2x - 3$

b. $5x^2 - 7x + 12$

c. $5x^2 + 2x + 5$

d. $5x^2 - 23x - 15$

e. $5x^2 + x - 4$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.28
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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18. Use synthetic division to divide.

$(x^3 - 27x + 54) \div (x - 3)$

a. $x^2 + 3x - 18$

b. $x^2 - 3x - 27$

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c. $x^2 + 9x + 18$

d. $x^2 + 9x - 6$

e. $x^2 + 6x + 9$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.33
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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19. Use synthetic division to divide.

$$\frac{-4x^3 + 23x^2 - 31x + 12}{4x - 3}$$

a. $4x^2 + 12x + 16$

b. $x^2 + 4x - 4$

c. $-16x^2 + 12x + 16$

d. $-4x^2 - 12x + 16$

e. $-x^2 + 5x - 4$

ANSWER: e
POINTS: 1
REFERENCES: 3.3.37
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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20. Write $f(x) = x^3 + 7x^2 + 13x + 22$ in the form $f(x) = (x - k)q(x) + r$ when $k = -5$.

a. $f(x) = (x + 5)(x^2 + 2x + 3) + 7$

b. $f(x) = (x + 5)(x^2 - 2x + 3) - 7$

c. $f(x) = (x - 5)(x^2 + 2x + 3) - 7$

d. $f(x) = (x - 5)(x^2 - 2x + 3) + 7$

e. $f(x) = (x + 5)(x^2 + 2x + 3)$

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Section 2.3 - Polynomial and Synthetic Division

ANSWER: a
POINTS: 1
REFERENCES: 3.3.47
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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21. If $f(x) = -4x^2 + 6x - 7$, use synthetic division to evaluate $f(2)$.

a. $f(2) = -11$
b. $f(2) = 21$
c. $f(2) = -35$
d. $f(2) = -3$
e. $f(2) = -1$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.55
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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22. If $x = -4$ is a root of $x^3 + 5x^2 - 16x - 80 = 0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

a. $(x + 5)(x - 5)(x - 4)$; $x = -5, 5, 4$
b. $(x + 5)^2(x + 4)$; $x = -5, -4$
c. $(x + 5)(x + 4)^2$; $x = -5, -4$
d. $(x - 5)(x + 4)(x - 4)$; $x = 5, -4, 4$
e. $(x + 5)(x + 4)(x - 4)$; $x = -5, -4, 4$

ANSWER: e
POINTS: 1
REFERENCES: 3.3.60
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.3 - Polynomial and Synthetic Division

23. If $x = \frac{2}{7}$ is a root of $49x^3 - 126x^2 + 60x - 8 = 0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

a. $(7x + 2)^2(x - 2)$; $x = -\frac{2}{7}, 2$

b. $(7x - 2)(x - 2)^2$; $x = \frac{2}{7}, 2$

c. $(7x + 2)(x - 2)^2$; $x = -\frac{2}{7}, 2$

d. $(7x - 2)^2(x - 2)$; $x = \frac{2}{7}, 2$

e. $(7x - 2)(7x + 2)(x - 2)$; $x = \frac{2}{7}, -\frac{2}{7}, 2$

ANSWER: d
POINTS: 1
REFERENCES: 3.3.62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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24. If $x = \sqrt{3}$ is a root of $x^3 - 4x^2 - 3x + 12 = 0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

a. $(x - 4)(x - \sqrt{3})(x + \sqrt{3})$; $4, \sqrt{3}, -\sqrt{3}$

b. $(x + 4)(x + \sqrt{3})^2$; $-4, \sqrt{3}$

c. $(x + 4)(x - \sqrt{3})^2$; $-4, \sqrt{3}$

d. $(x + 4)(x + \sqrt{3})^2$; $4, -\sqrt{3}$

e. $(x + 4)^2(x - \sqrt{3})$; $-4, \sqrt{3}$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.63
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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25. Using the factors $(x + 4)$ and $(x + 2)$, find the remaining factor(s) of $f(x) = x^3 + 7x^2 + 14x + 8$ and write the polynomial in fully factored form.

a. $f(x) = (x + 4)(x + 2)^2$

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b. $f(x) = (x + 4)(x + 2)(x + 1)$

c. $f(x) = (x + 4)(x + 2)(x + 5)$

d. $f(x) = (x + 4)^2(x + 2)$

e. $f(x) = (x + 4)(x + 2)(x - 1)$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.67b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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26. Using the factors $(5x + 2)$ and $(x - 1)$, find the remaining factor(s) of $f(x) = -10x^4 + 61x^3 - 54x^2 - 7x + 10$ and write the polynomial in fully factored form.

a. $f(x) = (5x + 2)(-x + 5)(2x - 1)(x - 1)$

b. $f(x) = (5x + 2)^2(2x - 1)(x + 1)$

c. $f(x) = (5x + 2)^2(2x - 1)(x - 1)$

d. $f(x) = (5x + 2)^2(x - 1)^2$

e. $f(x) = (5x + 2)(-x - 5)^2(x + 1)$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.70
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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27. Use the *zero* or *root* feature of a graphing utility to approximate the zeros of $f(x) = 2x^3 + 8x^2 - 5x - 7$ accurate to the nearest thousandth.

a. x = -8.492, -0.695, 1.186

b. $x = -4.692$

c. $x = -3.575$

d. x = -3.910, -0.763, 1.173

e. x = -4.388, -0.720, 1.108

ANSWER: e
POINTS: 1
REFERENCES: 3.3.75a

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28. Simplify the rational expression, $\frac{4x^3+x^2-51x+36}{4x-3}$, by using long division or synthetic division.

a. $x^2+7x+16$

b. $x^2-7x-12$

c. $x^2-6x+12$

d. x^2+8x+9

e. x^2+x-12

ANSWER: e
POINTS: 1
REFERENCES: 3.3.81
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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29. Simplify the rational expression, $\frac{x^4+3x^3-25x^2-39x+180}{x^2-6x+9}$, by using long division or synthetic division.

a. $x^2+9x+20$

b. x^2+x+25

c. $-x^2+8x+25$

d. x^2+x-12

e. $-x^2-x+20$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.83
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.3 - Polynomial and Synthetic Division

30. Use long division to divide.

$(2x^2+12x+16)\div(x+4)$

a. $2x-4,\ x\neq -4$
b. $2x+4,\ x\neq -4$
c. $2x^2-4,\ x\neq -4$
d. $2x^2+4,\ x\neq -4$
e. $2x^2+4x,\ x\neq -4$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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31. Use long division to divide.

$(7x^2-29x-30)\div(x-5)$

a. $7x^2+6,\ x\neq 5$
b. $7x-6,\ x\neq 5$
c. $7x^2-6,\ x\neq 5$
d. $7x+6,\ x\neq 5$
e. $7x+5,\ x\neq 5$

ANSWER: d
POINTS: 1
REFERENCES: 3.3.12
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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32. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$f(x)=5x^3-9x+8,\ f(2)$

a. –30

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b. 30
c. 32
d. 27
e. 31

ANSWER: b
POINTS: 1
REFERENCES: 3.3.55a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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33. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$f(x) = 5x^3 - 5x + 6,\ f(-2)$

a. 27
b. –27
c. –23
d. –24
e. –22

ANSWER: d
POINTS: 1
REFERENCES: 3.3.55b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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34. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$f(x) = 4x^3 - 3x + 3,\ f\left(\frac{1}{2}\right)$

a. 3
b. 4
c. 2
d. –1
e. 0

ANSWER: c

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POINTS: 1
REFERENCES: 3.3.55c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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35. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$f(x) = 3x^6 - 4x^4 - 8x^2 + 3, \quad f(4)$

a. 11,141
b. 11,140
c. 11,139
d. 11,136
e. –11,136

ANSWER: c
POINTS: 1
REFERENCES: 3.3.56a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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36. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$f(x) = 2x^6 + 8x^4 - 5x^2 + 7, \quad f(-3)$

a. 2,070
b. 2,065
c. 2,068
d. –2,065
e. 2,069

ANSWER: c
POINTS: 1
REFERENCES: 3.3.56d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.3 - Polynomial and Synthetic Division

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37. Write the function in the form $f(x) = (x - k)q(x) + r$ for the given value of k and demonstrate that $f(k) = r$.

$f(x) = x^3 - 5x^2 - 27x + 28, \quad k = 8$

a. $(x-8)(x^2-3x-3)+4$

b. $(x+8)(x^2+3x-3)+4$

c. $(x-8)(x^2+3x-3)+4$

d. $(x-8)(x^2+3x-3)-4$

e. $(x-8)(x^2-3x-3)-4$

ANSWER: c
POINTS: 1
REFERENCES: 3.3.47
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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38. Use long division to divide.

$(x^3 + 343) \div (x + 7)$

a. $-x^2+7x+49, x \neq -7$

b. $x^2-343x+49, x \neq -7$

c. $x^2-7x-49, x \neq -7$

d. $x^2-7x+49, x \neq -7$

e. $x^2+7x-49, x \neq -7$

ANSWER: d
POINTS: 1
REFERENCES: 3.3.18
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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39. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

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Section 2.3 - Polynomial and Synthetic Division

$h(x) = x^3 - 4x^2 - 9x + 7, \quad h(2)$

a. –18
b. –17
c. –21
d. –15
e. –19

ANSWER: e
POINTS: 1
REFERENCES: 3.3.57a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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40. Use synthetic division to divide.

$(3x^3 - 30x^2 + 53x - 40) \div (x - 8)$

a. $6x^2 - 3x - 5, \ x \neq 8$

b. $6x^2 - 3x + 5, \ x \neq 8$

c. $3x^2 - 6x + 5, \ x \neq 8$

d. $3x^2 - 6x - 5, \ x \neq 8$

e. $3x^2 + 6x + 5, \ x \neq 8$

ANSWER: c
POINTS: 1
REFERENCES: 3.3.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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41. Use synthetic division to divide.

$(5x^3 + 17x^2 + 3x - 9) \div (x + 3)$

a. $5x^2 + 2x + 3, x \neq -3$

b. $5x^2 + 2x - 3, x \neq -3$

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c. $5x^2-2x-3, x \neq -3$

d. $2x^2-5x+3, x \neq -3$

e. $2x^2-5x-3, x \neq -3$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.28
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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42. Use synthetic division to divide.

$(4x^3-8x+24x^2-48) \div (x+6)$

a. $4x^2-8, x \neq -6$

b. $4x^2+8, x \neq -6$

c. $-4x^2-8, x \neq -6$

d. $4x^3-8, x \neq -6$

e. $4x^3+8, x \neq -6$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.31
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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43. Use synthetic division to divide.

$(-x^3+101x-220) \div (x+11)$

a. $-x^2+11x-20, x \neq -11$

b. $-x^2+11x+20, x \neq -11$

c. $x^2+11x+20, x \neq -11$

d. $-x^2-11x-20, x \neq -11$

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e. $x^2+11x-20, x \neq -11$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.33
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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44. Use synthetic division to divide.

$$\frac{x^3+64}{x+4}$$

a. $x^2+4x+16, x \neq -4$

b. $x^2-4x-16, x \neq -4$

c. $x^2+4x-16, x \neq -4$

d. $x^2-4x+16, x \neq -4$

e. $-x^2+4x-16, x \neq -4$

ANSWER: d
POINTS: 1
REFERENCES: 3.3.39
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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45. Use synthetic division to divide.

$$\frac{x^3-64}{x-4}$$

a. $x^2+4x+16, x \neq 4$

b. $x^2+4x-16, x \neq 4$

c. $x^2-4x+16, x \neq 4$

d. $-x^2+4x+16, x \neq 4$

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e. $x^2 - 4x - 16, x \neq 4$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.40
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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46. Use synthetic division to divide.

$$\frac{4x^3 + 20x^2 - 27x - 18}{x + \frac{1}{2}}$$

a. $4x^2 + 18x + 36, x \neq -\frac{1}{2}$

b. $4x^2 + 18x - 36, x \neq -\frac{1}{2}$

c. $4x^2 - 18x - 36, x \neq -\frac{1}{2}$

d. $-4x^2 + 18x - 36, x \neq -\frac{1}{2}$

e. $-x^2 - 18x - 36, x \neq -\frac{1}{2}$

ANSWER: b
POINTS: 1
REFERENCES: 3.3.45
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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47. Use long division to divide.

$(4x^3 - 5x^2 - 1x + 35) \div (4x + 7)$

a. $x^2 - 3x - 5, x \neq -\frac{7}{4}$

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b. $4x^3 - 3x + 5, x \neq -\frac{7}{4}$

c. $x^2 + 3x + 5, x \neq -\frac{7}{4}$

d. $x^2 - 3x + 5, x \neq -\frac{7}{4}$

e. $4x^2 - 3x - 5, x \neq -\frac{7}{4}$

ANSWER: d
POINTS: 1
REFERENCES: 3.3.13
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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48. Use long division to divide.

$(6x^3 - 26x^2 + 45x - 28) \div (3x - 4)$

a. $2x^2 - 6x + 7, x \neq \frac{4}{3}$

b. $2x^2 - 6x - 7, x \neq \frac{4}{3}$

c. $-2x^2 - 6x + 7, x \neq \frac{4}{3}$

d. $2x^2 + 6x + 7, x \neq \frac{4}{3}$

e. $2x^2 + 6x - 7, x \neq \frac{4}{3}$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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49. Use long division to divide.

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Section 2.3 - Polynomial and Synthetic Division

$(x^3 - 343) \div (x - 7)$

a. $x^2 + 7x + 49, x \neq 7$

b. $x^2 - 7x + 49, x \neq 7$

c. $x^2 + 7x - 49, x \neq 7$

d. $x^2 - 7x - 49, x \neq 7$

e. $-x^2 + 7x + 49, x \neq 7$

ANSWER: a
POINTS: 1
REFERENCES: 3.3.17
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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50. Use the Remainder Theorem and synthetic division to find the function value. Verify your answer using another method.

$h(x) = x^3 - 3x^2 - 6x + 5, h(-10)$

a. –1,237
b. –1,231
c. –1,234
d. –1,235
e. –1,233

ANSWER: d
POINTS: 1
REFERENCES: 3.3.57c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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51. Use long division to divide.

$(-x^2 - 5x - 6) \div (x + 2)$

a. $-x^2 - 7 - \dfrac{20}{x + 2}$

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b. $-x-3$

c. $-x-7-\dfrac{10}{x+2}$

d. $-x-10$

e. $x+3$

ANSWER: b
POINTS: 1
REFERENCES: 97
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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52. Use synthetic division to divide.

$(3x^3-19x^2+30x-8)\div(x-4)$

a. $3x^2-10x+8$

b. $3x^2-7x+2$

c. $3x^2+7x+4$

d. $3x^2-13x-3$

e. $3x^2+5x-6$

ANSWER: b
POINTS: 1
REFERENCES: 102
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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53. Use synthetic division to divide.

$(-12+2x^3+22x-12x^2)\div(x-3)$

a. $2x^2-5x+3$

b. $2x^2-10x-8$

c. $2x^2-x+12$

d. $2x^2-6x+4$

e. $2x^2+6x-2$

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ANSWER: d
POINTS: 1
REFERENCES: 103
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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54. Use long division to divide.

$(x^4+4x^2+6)\div(x^2+x+4)$

a. x^2-x+1

b. x^2+x-1

c. $x^2-x+1+\dfrac{3x+2}{x^2+x+4}$

d. $x^2+x-1+\dfrac{3x-4}{x^2+x+4}$

e. $x^2-x+1+\dfrac{4}{x^2-x+1}$

ANSWER: c
POINTS: 1
REFERENCES: 100
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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55. Use synthetic division to express $P(x)=3x^3-10x^2-23x-35$ in the form (*divisor*)(*quotient*) + *remainder* for the divisor $x-5$.

a. $(x-3)(25x^2+5x+2)-25$

b. $(x-5)(3x^2+5x+2)-25$

c. $(x-5)(3x^2+2)-25$

d. $(x-5)(3x^2+x+2)$

e. none of these

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)

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Section 2.3 - Polynomial and Synthetic Division

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STUDENT ENTRY MODE: Basic
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56. Use synthetic division to express $P(x) = 2x^3 + 3x^2 - 28x + 63$ in the form (*divisor*)(*quotient*) + *remainder* for the divisor $x + 5$.

a. $(x+5)(2x^2-7x+28)+7$

b. $(x+5)(2x^2-7x+7)+28$

c. $(x-5)(2x^2-7x+7)-28$

d. $(x+5)(28x^2-x+7)+28$

e. none of these

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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57. Use synthetic division to perform the division.

$$\frac{3x^3-6x^2-23x+8}{x+2}$$

a. $3x^2-12x+1+\frac{6}{x+2}$

b. $3x^2-12x+6+\frac{8}{x+2}$

c. $3x^2-12x+1$

d. $x^2-12x+3-\frac{6}{x+2}$

e. none of these

ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.3 - Polynomial and Synthetic Division

58. Write $f(x) = x^3 + 5x^2 + 15x + 28$ in the form $f(x) = (x - k)q(x) + r$ when $k = -3$.

a. $f(x) = (x + 3)(x^2 + 2x + 9)$

b. $f(x) = (x + 3)(x^2 + 2x + 9) + 1$

c. $f(x) = (x - 3)(x^2 + 2x + 9) - 1$

d. $f(x) = (x - 3)(x^2 - 2x + 9) + 1$

e. $f(x) = (x + 3)(x^2 - 2x + 9) - 1$

ANSWER: b
POINTS: 1
REFERENCES: 107
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 5:23 PM

59. Let $P(x) = 7x^3 + 4x^2 - 9x + 10$.

Use synthetic division to find the value P (–6).

a. –2,608
b. –1,303
c. –1,305
d. –1,304
e. none of these

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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60. If $x = -2$ is a root of $x^3 + 5x^2 - 4x - 20 = 0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

a. $(x - 5)(x + 2)(x - 2)$; $x = 5, -2, 2$
b. $(x + 5)(x + 2)(x - 2)$; $x = -5, -2, 2$
c. $(x + 5)(x + 2)^2$; $x = -5, -2$
d. $(x + 5)^2(x + 2)$; $x = -5, -2$

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e. $(x+5)(x-5)(x-2);\ x=-5,5,2$

ANSWER: b
POINTS: 1
REFERENCES: 111
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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61. If $x=\frac{3}{5}$ is a root of $25x^3-105x^2+99x-27=0$, use synthetic division to factor the polynomial completely and list all real solutions of the equation.

a. $(5x-3)(5x+3)(x-3);\ x=\frac{3}{5}, -\frac{3}{5}, 3$

b. $(5x+3)^2(x-3);\ x=-\frac{3}{5}, 3$

c. $(5x-3)(x-3)^2;\ x=\frac{3}{5}, 3$

d. $(5x+3)(x-3)^2;\ x=-\frac{3}{5}, 3$

e. $(5x-3)^2(x-3);\ x=\frac{3}{5}, 3$

ANSWER: e
POINTS: 1
REFERENCES: 112
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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62. Using the factors (x - 2) and (x + 4), find the remaining factor(s) of $f(x)=x^3-x^2-14x+24$ and write the polynomial in fully factored form.

a. $f(x)=(x-2)(x+4)(x-3)$

b. $f(x)=(x-2)(x+4)^2$

c. $f(x)=(x-2)(x+4)(x+3)$

d. $f(x)=(x-2)^2(x+4)$

e. $f(x)=(x-2)(x+4)(x+1)$

ANSWER: a
POINTS: 1
REFERENCES: 114

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STUDENT ENTRY MODE: Basic
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63. Find all the rational zeros of the function $f(x) = -2x^4 - x^3 + 51x^2 + 25x - 25$.

a. $x = 1, -5, 5, -2$
b. $x = -2, -5, -5$
c. $x = -1, -5, 5, \frac{1}{2}$
d. $x = -\frac{1}{5}, \frac{5}{2}, \frac{1}{2}, 5$
e. $x = -2, -5, \frac{5}{2}, \frac{1}{2}$

ANSWER: c
POINTS: 1
REFERENCES: 122
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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64. Find all the rational zeros of the function $f(x) = x^5 - 5x^4 + 11x^3 - 23x^2 + 28x - 12$.

a. $x = -2, 2, 1, 3$
b. $x = 3, 1$
c. $x = -2, -1, -3$
d. $x = -1, -2$
e. $x = -2, 2, -1, 1, -3$

ANSWER: b
POINTS: 1
REFERENCES: 124
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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65. Find all real zeros of the polynomial $f(x) = x^4 - 113x^2 + 3136$ and determine the multiplicity of each.

a. $x = 49$, multiplicity 2; $x = 64$, multiplicity 2
b. $x = 7$, multiplicity 2; $x = 8$, multiplicity 2
c. $x = 49$, multiplicity 2; $x = 8$, multiplicity 1

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d. $x = -7$, multiplicity 2; $x = -8$, multiplicity 2

e. $x = 7$, multiplicity 1; $x = -7$, multiplicity 1; $x = 8$, multiplicity 1; $x = -8$, multiplicity 1

ANSWER: e
POINTS: 1
REFERENCES: 91
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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66. Use the *zero* or *root* feature of a graphing utility to approximate the zeros of $f(x) = 2x^3 + 8x^2 - 5x - 7$

accurate to the nearest thousandth.

a. $x = -4.692$

b. x = -8.492, -0.695, 1.186

c. $x = -3.575$

d. x = -4.388, -0.720, 1.108

e. x = -3.910, -0.763, 1.173

ANSWER: d
POINTS: 1
REFERENCES: 116
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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67. Use synthetic division to perform the division.

$$\frac{3x^4 - 7x^3 - 16x + 5}{x - 3}$$

a. $x^3 + x^2 + 3x + 2 - \dfrac{11}{x-3}$

b. $3x^3 + 2x^2 + 6x + 2 + \dfrac{11}{x-3}$

c. $3x^3 - 2x^2 + 6x - 2 + \dfrac{11}{x-3}$

d. $3x^3 + 2x^2 + 6x + 2 + 11$

e. none of these

ANSWER: b

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Section 2.3 - Polynomial and Synthetic Division

POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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68. Use Descartes' rule of signs to find the number of possible positive, negative, and nonreal roots for the following equation.

$4x^7 + 9x^2 + 5x + 10 = 0$

a. 0 positive; 1 negative; 6 nonreal
b. 2 positive; 1 or 3 negative; 4 or 0 nonreal
c. 0 positive; 0 negative; 7 nonreal
d. 0 positive; 0 or 2 negative; 5 or 7 nonreal
e. none of these

ANSWER: e
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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69. Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x) = 2x^3 - 2x^2 + 3x - 4$.

a. 3 positive reals or 1 positive real; 3 negative reals or 1 negative real
b. 3 positive reals or 1 positive real; no negative reals
c. 1 positive real; 3 negative reals or 1 negative real
d. 3 positive reals or 1 positive real; 1 negative real
e. no positive reals; no negative reals

ANSWER: b
POINTS: 1
REFERENCES: 136
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 11/14/2014 3:51 AM

70. Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x) = 4x^3 + 3x^2 + 5x + 1$.

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a. 3 positive reals or 1 positive real; 3 negative reals or 1 negative real
b. 3 positive reals or 1 positive real; no negative reals
c. no positive reals; 3 negative reals or 1 negative real
d. 1 positive real; 3 negative reals or 1 negative real
e. no positive reals; no negative reals

ANSWER: c
POINTS: 1
REFERENCES: 137
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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71. Find all the real zeros of $f(x) = 4x^3 - 20x^2 + 17x - 4$.

a. $x = \frac{1}{2}, 4$
b. $x = -\frac{1}{2}, -\frac{1}{4}$
c. $x = \frac{1}{4}, -2$
d. $x = \frac{1}{2}, -\frac{1}{4}$
e. $x = \frac{1}{2}, -4$

ANSWER: a
POINTS: 1
REFERENCES: 138
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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72. Find all the real zeros of $f(x) = 2x^3 - 6x^2 + 2x - 6$.

a. $x = 3, -\frac{1}{3}$
b. $x = 2, 1, -6$
c. $x = \pm 1, 3$
d. $x = 3$
e. $x = \frac{1}{2}, -\frac{1}{6}$

ANSWER: d
POINTS: 1

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REFERENCES: 139
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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73. Find all rational roots of the equation.

$x^3 + 8x^2 - x - 8 = 0$

a. $x = -2$
b. $x = -1$
c. $x = 8$
d. $x = 1$
e. $x = 2$
f. $x = -8$

ANSWER: b, d, f
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
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74. Find all rational roots of the equation.

$x^3 - 9x^2 - x + 9 = 0$

a. $x = 8$
b. $x = 1$
c. $x = -1$
d. $x = 4$
e. $x = 0$
f. $x = 9$

ANSWER: b, c, f
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
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75. The number $(1 + i)$ is a root of the equation.

$x^3 - 10x^2 + 18x - 16 = 0$

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Find the other roots of the equation.

a. $x = 1 - i$
b. $x = 1 + i$
c. $x = 5$
d. $x = 8$

ANSWER: a, d
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
DATE CREATED: 6/10/2014 4:19 PM
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76. Find all rational roots of the equation.

$7x^3 - 2x^2 + 7x - 2 = 0$

a. $x = -i$
b. $x = -\frac{2}{7}$
c. $x = i$
d. $x = \frac{2}{7}$
e. $x = -\frac{2}{5}$
f. $x = \frac{2}{5}$

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
DATE CREATED: 6/10/2014 4:19 PM
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77. Find all rational roots of the equation.

$x^4 - 12x^3 + 49x^2 - 78x + 40 = 0$

a. $x = 5$
b. $x = 6$
c. $x = 1$
d. $x = -1$
e. $x = 2$
f. $x = 4$

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g. $x = -4$

ANSWER: a, c, e, f
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
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78. Find all rational roots of the equation.

$147x^3 - 98x^2 + 27x - 18 = 0$

a. $x = \frac{2}{5}$

b. $x = \frac{2}{3}$

c. $x = -\frac{3}{7}i$

d. $x = \frac{3}{7}i$

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 11/14/2014 7:19 AM

79. Find all rational roots of the equation.

$13x^3 - 2x^2 + 52x - 8 = 0$

a. $x = \frac{2}{3}$

b. $x = -2i$

c. $x = 2i$

d. $x = -\frac{2}{13}$

e. $x = \frac{2}{13}$

ANSWER: e
POINTS: 1
QUESTION TYPE: Multiple Response
HAS VARIABLES: True

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Section 2.3 - Polynomial and Synthetic Division

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80. Let $P(x) = 2x^3 + 9x^2 - 7x + 3$.

Use synthetic division to find the value P (–7).
ANSWER: –193
POINTS: 1
QUESTION TYPE: Numeric Response
HAS VARIABLES: True
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 11/14/2014 7:36 AM

81. Use long division to divide.
$(x^3 - 5x - 3) \div (x - 2)$

ANSWER:

$$
\begin{array}{rl}
 & x^2 + 2x - 1 \\
x - 2) & x^3 + 0x^2 - 5x - 3 \\
 & \underline{x^3 - 2x^2} \\
 & \quad 2x^2 - 5x \\
 & \quad \underline{2x^2 - 4x} \\
 & \qquad -x - 3 \\
 & \qquad \underline{-x + 2} \\
 & \qquad\quad -5
\end{array}
$$

POINTS: 1
REFERENCES: 101
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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82. Use synthetic division to perform the division.

$$\frac{3x^3 + 4x^2 + 18x - 25}{x - 1}$$

ANSWER: $3x^2 + 7x + 25$

POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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83. Use synthetic division to divide.

$$\frac{4x^3 + 31x^2 + 52x - 15}{x - \frac{1}{4}}$$

ANSWER:

$\frac{1}{4}$	4	31	52	-15
		1	8	15
	4	32	60	0

$$4x^2 + 32x + 60$$

POINTS: 1
REFERENCES: 106
QUESTION TYPE: Objective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 11/28/2014 1:14 AM
DATE MODIFIED: 11/28/2014 3:07 AM

Use Descartes' rule of signs to find the number of possible positive, negative, and nonreal roots for each equation. Match each polynomial equation with the corresponding answer.

Choose the correct letter for each question.
a. $3x^3 + 10x^2 - 4x + 4 = 0$

b. $3x^3 - 10x^2 - 4x - 4 = 0$

QUESTION TYPE: Matching
HAS VARIABLES: False
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 5/25/2021 6:03 PM

84. 1 positive; 0 or 2 negative; 0 or 2 nonreal.
ANSWER: b
POINTS: 1

85. 0 or 2 positive; 1 negative; 0 or 2 nonreal.
ANSWER: a
POINTS: 1

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Section 2.3 - Polynomial and Synthetic Division

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Section 2.4 - Complex Numbers

1. Find real numbers a and b such that the equation is true.

$a + bi = -8 + 18i$

a. $a = -12, b = 22$
b. $a = -10, b = 20$
c. $a = -11, b = 21$
d. $a = -9, b = 19$
e. $a = -8, b = 18$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.5
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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2. Find real numbers a and b such that the equation is true.

$a + bi = 2 + 6i$

a. $a = 4, b = 8$
b. $a = 6, b = 10$
c. $a = 2, b = 6$
d. $a = 3, b = 2$
e. $a = 5, b = 9$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.6
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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3. Find real numbers a and b such that the equation is true.

$(a - 4) + (b + 5)i = 13 + 11i$

a. $a = 20,\ b = 9$
b. $a = 18,\ b = 7$
c. $a = 19,\ b = 8$
d. $a = 17,\ b = 6$

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e. $a = 21,\ b = 10$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.7
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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4. Find real numbers a and b such that the equation is true.

$(a+4)+2bi = 4-17i$

a. $a = 0,\ b = -\frac{21}{2}$
b. $a = 0,\ b = -\frac{17}{2}$
c. $a = 0,\ b = -\frac{19}{2}$
d. $a = 0,\ b = -9$
e. $a = 0,\ b = -10$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.8
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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5. Write the complex number in standard form.

$8+\sqrt{-25}$

a. $8+25i$
b. $11-8i$
c. $11+8i$
d. $8-5i$
e. $8+5i$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.9
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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Section 2.4 - Complex Numbers

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6. Write the complex number in standard form.

$3 - \sqrt{-30}$

a. $3 + \sqrt{30}i$
b. $4 + \sqrt{30}i$
c. $7 - \sqrt{30}i$
d. $3 - \sqrt{30}i$
e. $4 - \sqrt{30}i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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7. Write the complex number in standard form.

$\sqrt{-36}$

a. $\sqrt{37}i$
b. $-\sqrt{39}i$
c. $6i$
d. $\sqrt{39}i$
e. $-6i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.13
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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8. Write the complex number in standard form.

$\sqrt{-36}$

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a. $6i$
b. $-6i$
c. $36i$
d. $7i$
e. $-36i$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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9. Write the complex number in standard form.

$-4i + i^2$

a. $-1 + 4i$
b. $-1 + 7i$
c. $1 + 4i$
d. $1 - 4i$
e. $-1 - 4i$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.17
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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10. Write the complex number in standard form.

$\sqrt{-17.64}$

a. $17.64i$
b. $4.2i$
c. $7.2i$
d. $-4.2i$
e. $-17.64i$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.19

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11. Write the complex number in standard form.

$\sqrt{-0.0001}$

a. $-0.01i$
b. $-0.0001i$
c. $3.01i$
d. $0.01i$
e. $0.0001i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.20
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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12. Perform the addition or subtraction and write the result in standard form.

$(7+i)+(5-5i)$

a. $16-8i$
b. $15-7i$
c. $12-4i$
d. $14-6i$
e. $13-5i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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13. Perform the addition or subtraction and write the result in standard form.

$(12-i)-(7-i)$

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a. 5
b. 7
c. 9
d. 8
e. 6

ANSWER: a
POINTS: 1
REFERENCES: 1.5.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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14. Perform the addition or subtraction and write the result in standard form.

$19i - (15 - 3i)$

a. $15 + 22i$
b. $-15 - 22i$
c. $15 - 22i$
d. $-15 + 22i$
e. $-15 + 25i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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15. Perform the addition or subtraction and write the result in standard form.

$33 + (-10 + 13i) + 20i$

a. $23 + 33i$
b. $23 - 33i$
c. $-23 - 33i$
d. $-23 + 33i$
e. $23 + 35i$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.28

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16. Perform the addition or subtraction and write the result in standard form.

$(1.5+6.7i)+(-7.3+6.5i)$

a. $-5.8+14.2i$
b. $-5.8-14.2i$
c. $-5.8-13.2i$
d. $-5.8+13.2i$
e. $-5.8+15.2i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.30
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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17. Perform the operation and write the result in standard form.

$(1+i)(9-8i)$

a. $18+i$
b. $17+i$
c. $19+i$
d. $21+i$
e. $20+i$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.31
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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18. Perform the operation and write the result in standard form.

$19i(1-6i)$

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a. $115+19i$
b. $118+19i$
c. $116+19i$
d. $114+19i$
e. $117+19i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.33
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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19. Perform the operation and write the result in standard form.

$\left(\sqrt{19}+\sqrt{8}\,i\right)\left(\sqrt{19}-\sqrt{8}\,i\right)$

a. 31
b. 27
c. 28
d. 29
e. 30

ANSWER: b
POINTS: 1
REFERENCES: 1.5.35
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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20. Perform the operation and write the result in standard form.

$(4+5i)^2$

a. $-9+40i$
b. $-9-40i$
c. $9-40i$
d. $-40+9i$
e. $9+40i$

ANSWER: a
POINTS: 1

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REFERENCES: 1.5.37
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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21. Perform the operation and write the result in standard form.

$(8-7i)^2$

a. $15-112i$
b. $-15-112i$
c. $15+112i$
d. $17-112i$
e. $-15+112i$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.38
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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22. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$5+3i$

a. $5+3i, 34$
b. $5-3i, 9$
c. $5+3i, 9$
d. $-5-3i, 34$
e. $5-3i, 34$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.41
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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23. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

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$2-14i$

a. $2+14i,\ 196$
b. $2-14i,\ 196$
c. $2-14i,\ 200$
d. $-2+14i,\ 196$
e. $2+14i,\ 200$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.42
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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24. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$-14+\sqrt{13}\,i$

a. $-14-\sqrt{13}\,i,\ 209$
b. $14-\sqrt{13}\,i,\ 209$
c. $-14+\sqrt{13}\,i,\ 209$
d. $14+\sqrt{13}\,i,\ 209$
e. $-13-\sqrt{14}\,i,\ 209$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.44
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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25. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$-1-\sqrt{7}\,i$

a. $-1+\sqrt{7}\,i,\ 100$
b. $-1+\sqrt{7}\,i,\ 8$

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c. $-1+\sqrt{7}i, -6$

d. $1-\sqrt{7}i, 100$

e. $1+\sqrt{7}i, 8$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.43
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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26. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$\sqrt{-39}$

a. $-38i$, 39
b. $\sqrt{39}i$, 39
c. $1521i$, 39
d. $-\sqrt{39}i$, 39
e. $-i$, 39

ANSWER: d
POINTS: 1
REFERENCES: 1.5.45
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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27. Write the quotient in standard form.

$\frac{2}{i}$

a. $-\frac{i}{2}$

b. $-\frac{2}{i}$

c. $-2i$

d. $\frac{i}{2}$

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e. $2i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.49
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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28. Write the quotient in standard form.

$$-\frac{20}{5i}$$

a. $4i$
b. $\frac{4}{i}$
c. $-\frac{i}{4}$
d. $-4i$
e. $-\frac{4}{i}$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.50
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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29. Write the quotient in standard form.

$$\frac{11}{1-i}$$

a. $\frac{11}{2+i}$
b. $\frac{11}{2}i$
c. $\frac{11}{2-i}$

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d. $\frac{11}{2}+\frac{11}{2}i$

e. $\frac{11}{2}-\frac{11}{2}i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.52
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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30. Write the quotient in standard form.

$$\frac{4+i}{4-i}$$

a. $\frac{15}{17}-\frac{8}{17}i$

b. $\frac{15}{17}+\frac{17}{8}i$

c. $\frac{15}{17}+\frac{8}{17}i$

d. $\frac{17}{15}+\frac{17}{8}i$

e. $\frac{17}{15}+\frac{8}{17}i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.53
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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31. Write the quotient in standard form.

$$\frac{7-9i}{i}$$

a. $-7-9i$

b. $-9-7i$

c. $-9+7i$

d. $9-7i$

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e. $9 + 7i$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.55
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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32. Write the quotient in standard form.

$$\frac{6 + 12i}{4i}$$

a. $3 - \frac{3}{2}i$
b. $3 - 3i$
c. $3 + \frac{3}{2}i$
d. $3i - \frac{3}{2}$
e. $3i + \frac{3}{2}$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.56
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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33. Perform the operation and write the result in standard form.

$$\frac{3}{1 + i} - \frac{4}{1 - i}$$

a. $-\frac{1}{2} + \frac{2}{7}i$
b. $-\frac{1}{2} - \frac{2}{7}i$
c. $-\frac{1}{2} + \frac{7}{2}i$
d. $\frac{7}{2} - \frac{1}{2}i$

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e. $-\frac{1}{2}-\frac{7}{2}i$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.59
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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34. Write the complex number in standard form.

$\sqrt{-6}\cdot\sqrt{-7}$

a. $-\sqrt{6}$
b. $\sqrt{7}$
c. $\sqrt{6}$
d. $-\sqrt{42}$
e. $\sqrt{42}$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.63
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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35. Write the complex number in standard form.

$\sqrt{-20}\times\sqrt{-18}$

a. $6\sqrt{10}$
b. $-\sqrt{20}$
c. $-6\sqrt{10}$
d. $\sqrt{18}$
e. $\sqrt{20}$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.64

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36. Write the complex number in standard form.

$\left(\sqrt{-48}\right)^2$

a. $-\sqrt{48}$
b. -48
c. $\sqrt{23}$
d. 48
e. $\sqrt{48}$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.65
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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37. Write the complex number in standard form.

$\left(4+\sqrt{-6}\right)\left(6-\sqrt{-14}\right)$

a. $(24-2\sqrt{21})-(6\sqrt{6}-4\sqrt{14})i$
b. $(24+2\sqrt{21})+(6\sqrt{6}-4\sqrt{14})i$
c. $(24-2\sqrt{21})+(6\sqrt{6}-4\sqrt{14})i$
d. $(24+2\sqrt{21})-(6\sqrt{6}-4\sqrt{14})i$
e. $(24+2\sqrt{21})+(6\sqrt{6}+4\sqrt{14})i$

ANSWER: b
POINTS: 1
REFERENCES: 1.5.67
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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38. Write the complex number in standard form.

$\left(2-\sqrt{-15}\right)^2$

a. $-11+\sqrt{15}i$
b. $-11+4\sqrt{15}i$
c. $-11-\sqrt{15}i$
d. $-11-4\sqrt{15}i$
e. $4-15\sqrt{5}i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.68
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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39. Solve the equation and write complex solutions in standard form.

$x^2+10x+29=0$

a. $x=10-2i, 10+2i$
b. $x=-2-5i, -2+5i$
c. $x=-5+4i, -5-4i$
d. $x=-5-2i, -5+2i$
e. $x=-2+25i, -2-25i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.69
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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40. Solve the equation and write complex solutions in standard form.

$x^2-18x+91=0$

a. $x=9+\sqrt{10}i, 9-\sqrt{10}i$
b. $x=10+\sqrt{2}i, 10-\sqrt{2}i$
c. $x=9+\sqrt{2}i, 9-\sqrt{2}i$

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d. $x = 10+\sqrt{10}i,\ 10-\sqrt{10}i$

e. $x = 2+\sqrt{10}i,\ 2-\sqrt{10}i$

ANSWER: a
POINTS: 1
REFERENCES: 1.5.70
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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41. Simplify the complex number and write it in standard form.

$-5i^3+i^2$

a. $1+5i$
b. $-1-5i$
c. $-5i$
d. $1-5i$
e. $-1+5i$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.79
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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42. Simplify the complex number and write it in standard form.

$3i^2-7i^3$

a. $-7+3i$
b. $3+7i$
c. $-3-7i$
d. $-3+7i$
e. $3-7i$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.80
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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43. Simplify the complex number and write it in standard form.

$-42i^5$

a. $-42i^3$
b. $42i^3$
c. $-42i$
d. -42
e. $42i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.81
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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44. Simplify the complex number and write it in standard form.

$\left(\sqrt{-57}\right)^3$

a. $185{,}193i$
b. $-57i$
c. $-57\sqrt{57}i$
d. $57\sqrt{57}i$
e. $-185{,}193i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.83
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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45. Simplify the complex number and write it in standard form.

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$$\frac{14}{i^3}$$

a. $14i^3$
b. $-14i^3$
c. 14
d. $-14i$
e. $14i$

ANSWER: e
POINTS: 1
REFERENCES: 1.5.85
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/6/2014 6:49 AM

46. Simplify the complex number and write it in standard form.

$$\frac{1}{(2i)^3}$$

a. $\frac{1}{2}i$
b. $-\frac{1}{8}i$
c. $\frac{1}{8}i$
d. $-\frac{1}{2}i$
e. $8i$

ANSWER: c
POINTS: 1
REFERENCES: 1.5.86
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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47. Simplify the complex number and write it in standard form.

$(2i)^4$

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a. 16
b. –16
c. 16i
d. –16i
e. 2i

ANSWER: a
POINTS: 1
REFERENCES: 1.5.87
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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48. Simplify the complex number and write it in standard form.

$(-i)^5$

a. –1
b. –i
c. 1
d. i
e. 5

ANSWER: b
POINTS: 1
REFERENCES: 1.5.88
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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49. Raise the complex number to the fourth power.

4i

a. 256
b. –64
c. 64
d. 16
e. –256

ANSWER: a
POINTS: 1
REFERENCES: 1.5.91ac
QUESTION TYPE: Multi-Mode (Multiple choice)

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Section 2.4 - Complex Numbers

HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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50. Describe the error.

$\sqrt{-8}\sqrt{-8} = \sqrt{(-8)(-8)} = \sqrt{64} = 8$

a. $\sqrt{-8}\sqrt{-8} = \sqrt{8}i\sqrt{8}i = 8i = -8i$

b. $\sqrt{-8}\sqrt{-8} = \sqrt{8}i\sqrt{8}i = -64$

c. $\sqrt{-8}\sqrt{-8} = \sqrt{8}i\sqrt{8}i = 8i$

d. $\sqrt{-8}\sqrt{-8} = \sqrt{8}i\sqrt{8}i = 8i^2 = -8$

e. $\sqrt{-8}\sqrt{-8} = \sqrt{8}i\sqrt{8}i = 8i^2 = 8$

ANSWER: d
POINTS: 1
REFERENCES: 1.5.99
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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51. Do the operation and express the answer in $a + bi$ form.

$(5 - 5i) + (8 + 3i)$

a. $2 - 13i$
b. $-13 + 2i$
c. $13 + 2i$
d. $-13 - 2i$
e. $13 - 2i$

ANSWER: e
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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52. Do the operation and express the answer in $a + bi$ form.

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Section 2.4 - Complex Numbers

$\left(5-\sqrt{-25}\right)-(2i-3)$

a. $-8+14i$
b. $8+7i$
c. $-8+7i$
d. $-8-7i$
e. $8-7i$

ANSWER: e
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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53. Do the operation and express the answer in $a + bi$ form.

$\left(9-\sqrt{-100}\right)+\left(10+\sqrt{-36}\right)$

a. $19-4i$
b. $-38-8i$
c. $19+4i$
d. $-38+8i$
e. $-19+4i$

ANSWER: a
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
DATE MODIFIED: 10/6/2014 7:18 AM

54. Do the operation and express the answer in $a + bi$ form.

$\left(5+\sqrt{-16}\right)\left(4-\sqrt{-4}\right)$

a. $28-5i$
b. $-28+6i$
c. $-5+6i$
d. $5-6i$
e. $28+6i$

ANSWER: e
POINTS: 1

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Section 2.4 - Complex Numbers

QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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55. Do the operation and express the answer in $a + bi$ form.

$$\frac{-19}{i^{36}}$$

a. $19i$
b. $-19i$
c. $-190i$
d. -19
e. 19

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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56. Simplify the expression.

i^{-14}

a. i
b. $-3i$
c. $-i$
d. -1
e. 1

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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57. Do the operation and express the answer in $a + bi$ form.

$$\frac{17}{i^{31}}$$

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a. $-17i$
b. $-85i$
c. -17
d. $17i$
e. 17

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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58. Find the values of x and y.

$x + 59i = y - yi$

$x =$ _____

$y =$ _____

ANSWER: $-59;\ -59$
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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59. Do the operation and express the answer in $a + bi$ form. Do not use parentheses in your answer.

$(3 - 8i) + (10 + 5i)$

ANSWER: $13 - 3i$
POINTS: 1
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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60. Do the operation and express the answer in $a + bi$ form. Use fractions in your answer.

$$\frac{1}{9+i}$$

ANSWER: $\frac{9}{82} - \frac{i}{82}$

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Section 2.4 - Complex Numbers

POINTS:	1
QUESTION TYPE:	Subjective Short Answer
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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Section 2.5 - Zeros of Polynomial Functions

1. Find all the zeros of the function.

$x(x - 5)^2$

a. 0, 5
b. 1, 5
c. ±5
d. 1, –5
e. 0, –5

ANSWER: a
POINTS: 1
REFERENCES: 3.4.9
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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2. Find all the zeros of the function.

$(x - 3)(x + 9)^3$

a. –3, 9
b. 3, 9
c. –3, –9
d. –3, 3, –9
e. 3, –9

ANSWER: e
POINTS: 1
REFERENCES: 3.4.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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3. Find all the rational zeros of the function.

$x^3 - 7x^2 + 14x - 8$

a. –1, –2, –4
b. 1, 2, 4
c. 1, –2, 4
d. –1, 2, 4
e. –1, 2, –4

ANSWER: b

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POINTS: 1
REFERENCES: 3.4.19
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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4. Find all the rational zeros of the function.

$x^3 + 18x^2 + 105x + 200$

a. –8, 5
b. 5, 8
c. –8, –5
d. –8, –5, 5
e. –5, 8

ANSWER: c
POINTS: 1
REFERENCES: 3.4.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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5. Find all the rational zeros of the function.

$x^3 - 18x^2 + 108x - 216$

a. –6
b. 0, –1
c. 0, 6
d. 6
e. ±6

ANSWER: d
POINTS: 1
REFERENCES: 3.4.24
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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6. List all the possible rational zeros of f.

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Section 2.5 - Zeros of Polynomial Functions

$f(x) = x^3 + x^2 - 9x - 9$

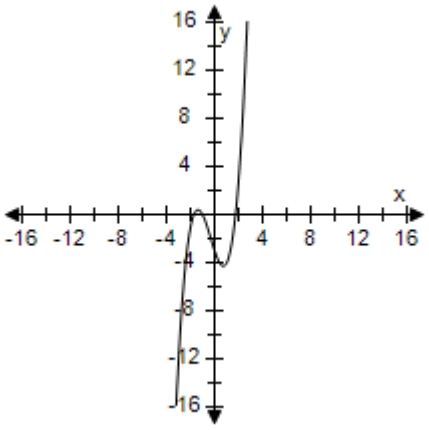
a. 1, –3, –9
b. 1, 3, 9
c. $\pm i, \pm 3i, \pm 9i$
d. –1, –3, ±9
e. ±1, ±3, ±9

ANSWER: e
POINTS: 1
REFERENCES: 3.4.33a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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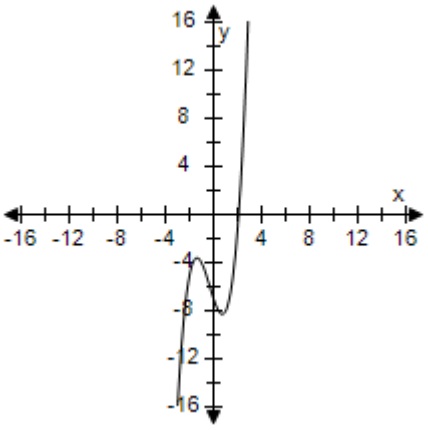
7. Select the graph of f.

$f(x) = x^3 + x^2 - 3x - 3$

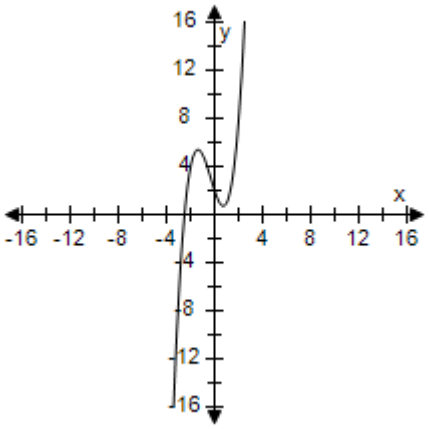
a.



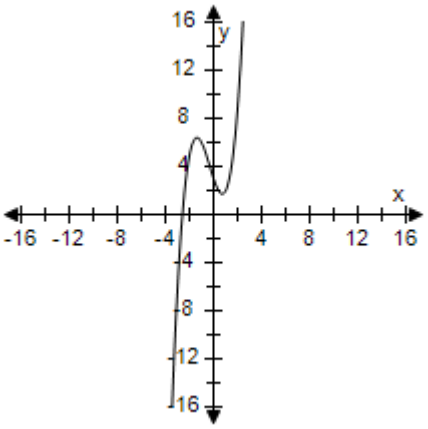
b.



c.



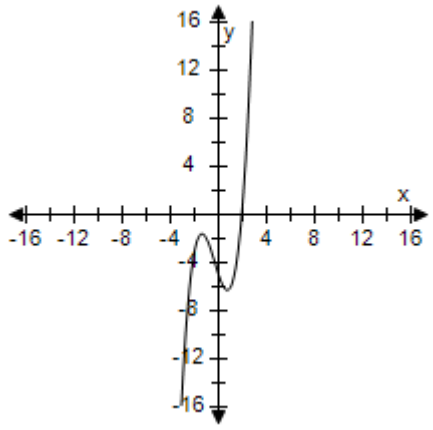
d.



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e.



ANSWER: a
POINTS: 1
REFERENCES: 3.4.33b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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8. Determine all real zeros of f.

$f(x) = x^3 + 4x^2 - 9x - 36$

a. –3, 4, 0
b. –3, 0, 3
c. –3, –4, 3
d. –3, 4, 3
e. –3, –4, 0

ANSWER: c
POINTS: 1
REFERENCES: 3.4.33c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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9. Use Descartes's Rule of Signs to determine the possible numbers of positive and negative zeros of the function.

$4x^5 - 8x$

a. Two negative zeros, two positive zeros

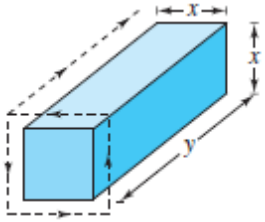
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b. One negative zero, three positive zeros
c. Two negative zeros, no positive zeros
d. One negative zero, one positive zero
e. One negative zero, four positive zeros

ANSWER: d
POINTS: 1
REFERENCES: 3.4.91
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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10. A rectangular package to be sent by a delivery service can have a maximum combined length and girth (perimeter of a cross section) of 168 cm.



Write a function that represents the volume of the largest possible package with a square cross-section with side x.

a. $V(x) = -4x^2(168 + x)$
b. $V(x) = 4x^2(42 + x)$
c. $V(x) = 4x^2(42 - x)$
d. $V(x) = 4x^2(168 - x)$
e. $V(x) = -4x^2(42 - x)$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.112a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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11. A bulk food storage bin with dimensions 3 m by 4 m by 5 m needs to be increased in size to hold five times as much food as the current bin. (Assume each dimension is increased by the same amount x.) Write a function that represents the volume of the new bin.

a. $V(x) = x^3 - 12x^2 - 47x + 60$

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b. $V(x) = x^3 + 12x^2 + 47x + 60$

c. $V(x) = x^3 + 12x^2 + 47x$

d. $V(x) = x^3 + 12x^2 - 47x - 60$

e. $V(x) = x^3 - 12x^2 + 47x - 60$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.115a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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12. A manufacturer wants to enlarge an existing manufacturing facility such that the total floor area is 1.5 times that of the current facility. The floor area of the current facility is rectangular and measures 88 m by 24 m. The manufacturer wants to increase each dimension by the same amount x. Write a function that represents the floor area of the enlarged facility.

a. $A(x) = (88 - x)(24 - x)$
b. $A(x) = (88 - x)(24 + x)$
c. $A(x) = (x + 88)(24 - x)$
d. $A(x) = (88 + x)(24 + x)$
e. $A(x) = (x - 88)(240 - x)$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.116a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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13. Find all the rational zeros of the function $f(x) = 2x^4 - 12x^3 - 34x^2 + 300x - 400$.

a. $x = -4, -5, 5, -\frac{1}{2}$

b. $x = 4, -5, 5, 2$

c. $x = 2, 20, -\frac{5}{2}, 2$

d. $x = 2, 20, -5$

e. $x = \frac{4}{5}, -\frac{5}{2}, 2, 5$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.28

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Section 2.5 - Zeros of Polynomial Functions

QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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14. Find all the rational zeros of the function $f(x) = 2x^5 - 9x^4 + 9x^3 - 3x^2 + 7x + 6$.

a. $x = -\frac{1}{2}, 3, 2$

b. $x = -\frac{2}{3}, -1, 2$

c. $x = \frac{1}{2}, 3, 1$

d. $x = -\frac{1}{2}, \frac{3}{2}$

e. $x = -\frac{1}{2}, \frac{3}{2}, 1$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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15. Find all real solutions of the polynomial equation $x^4 - 7x^3 + 42x - 36 = 0$.

a. $x = 1, 6, \pm\sqrt{6}$

b. $x = 1, 36$

c. $x = 1, \pm\sqrt{6}$

d. $x = 1, -7, -6$

e. $x = 1, -36, 12$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.30
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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16. Find all real solutions of the polynomial equation $6x^6 + x^5 + 29x^4 + 5x^3 + 19x^2 + 4x - 4 = 0$.

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a. $x = \frac{1}{3}, -\frac{1}{2}, \pm 1$

b. $x = -\frac{1}{3}, \frac{1}{2}, \pm 2$

c. $x = \frac{1}{3}, -\frac{1}{2}$

d. $x = \pm\frac{1}{3}, \pm\frac{1}{2}, \pm 1$

e. $x = \pm\frac{1}{3}, \pm\frac{1}{2}, \pm 2$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.32
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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17. Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x) = x^5 + 2x$.

a. 1 positive zero; 3 negative zeros or 1 negative zero
b. no positive zeros; no negative zeros
c. 1 positive zero; 5 negative zeros or 3 negative zeros or 1 negative zero
d. 5 positive zeros or 3 positive zeros or 1 positive zero; no negative zeros
e. 3 positive zeros or 1 positive zero; 3 negative zeros or 1 negative zero

ANSWER: b
POINTS: 1
REFERENCES: 3.4.91
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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18. Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x) = 6x^3 - 5x^2 + 6x - 6$.

a. 3 positive zeros or 1 positive zero; 3 negative zeros or 1 negative zero
b. no positive zeros; no negative zeros
c. 3 positive zeros or 1 positive zero; 1 negative zero
d. 1 positive zero; 3 negative zeros or 1 negative zero
e. 3 positive zeros or 1 positive zero; no negative zeros

ANSWER: e

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POINTS: 1
REFERENCES: 3.4.92
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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19. Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x) = 6x^3 + 3x^2 + 3x + 4$.

a. no positive zeros; no negative zeros
b. 1 positive zero; 3 negative zeros or 1 negative zero
c. no positive zeros; 3 negative zeros or 1 negative zero
d. 3 positive zeros or 1 positive zero; no negative zeros
e. 3 positive zeros or 1 positive zero; 3 negative zeros or 1 negative zero

ANSWER: c
POINTS: 1
REFERENCES: 3.4.94
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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20. Find all the real zeros of $f(x) = 4x^3 - 12x^2 - 15x - 4$.

a. $x = \frac{1}{4}, 2$
b. $x = -\frac{1}{2}, -\frac{1}{4}$
c. $x = \frac{1}{2}, -\frac{1}{4}$
d. $x = -\frac{1}{2}, 4$
e. $x = -\frac{1}{2}, -4$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.100
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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Section 2.5 - Zeros of Polynomial Functions

21. Find all the real zeros of $f(x) = 3x^3 - 9x^2 + 3x - 9$.

a. $x = 3$

b. $x = 3, -\frac{1}{3}$

c. $x = \frac{1}{3}, -\frac{1}{9}$

d. $x = \pm 1, 3$

e. $x = 3, 1, -9$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.101
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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22. Find all the zeros of the function.

$(t - 4)(t - 3)(t - 6i)(t + 6i)$

a. $-4, -3, \pm 6i$

b. $4, 3, 6i$

c. $4, 3, \pm 6i$

d. $-4, 3, \pm 6i$

e. $4, -3, \pm 6i$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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23. Find a polynomial function with real coefficients that has the given zeros.

$1, 3i$

a. $x^3 - x^2 - 9x - 9$

b. $x^3 + x^2 + 9x - 9$

c. $x^3 - x^2 + 9x - 9$

d. $x^3 + x^2 + 9x + 9$

e. $x^3 - x^2 + 9x + 9$

ANSWER: c

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POINTS: 1
REFERENCES: 3.4.45
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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24. Find a polynomial function with real coefficients that has the given zeros.

6, $-6i$

a. $x^3 - 6x^2 - 36x - 216$
b. $x^3 - 6x^2 + 36x + 216$
c. $x^3 + 6x^2 + 36x + 216$
d. $x^3 - 6x^2 + 36x - 216$
e. $x^3 + 6x^2 + 36x - 216$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.46
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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25. Find a polynomial function with real coefficients that has the given zeros.

6, $2 + i$

a. $x^3 - 10x^2 - 29x - 30$
b. $x^3 + 10x^2 + 29x - 30$
c. $x^3 - 10x^2 + 29x - 30$
d. $x^3 - 10x^2 + 29x + 30$
e. $x^3 + 10x^2 + 29x + 30$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.47
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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26. Find a polynomial function with real coefficients that has the given zeros.

$2, 4 + 3i$

a. $x^3 - 10x^2 + 41x + 50$
b. $x^3 + 10x^2 + 41x + 50$
c. $x^3 - 10x^2 + 41x - 50$
d. $x^3 - 10x^2 - 41x - 50$
e. $x^3 + 10x^2 + 41x - 50$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.48
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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27. Write the polynomial as the product of factors that are irreducible over the *rationals*.

$f(x) = x^4 + 42x^2 - 343$

a. $(x^2 + 49)(x^4 - 7)$
b. $(x^2 + 49)(x^2 - 7)$
c. $(x + 49)(x^2 - 7)$
d. $(x + 42)(x^2 - 7)$
e. $(x^2 + 49)(x + \sqrt{7})(x + \sqrt{7})$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.51a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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28. Write the polynomial as the product of linear and quadratic factors that are irreducible over the reals.

$f(x) = x^4 + 42x^2 - 343$

a. $(x^2 + 49)(x + \sqrt{7})(x - 7)$

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b. $(x^2 + 49)(x + \sqrt{7})(x + \sqrt{7})$

c. $(x^2 + 49)(x - \sqrt{7})(x - \sqrt{7})$

d. $(x^2 + 49)(x + \sqrt{7})(x - \sqrt{7})$

e. $(x^2 + 49)(x + 7)(x - \sqrt{7})$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.51b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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29. Write the polynomial in completely factored form.

$f(x) = x^4 + 20x^2 - 125$

a. $(x + 5)(x - 5)(x + \sqrt{5})(x - \sqrt{5})$

b. $(x + 5)(x - 5i)(x + \sqrt{5})(x - \sqrt{5}i)$

c. $(x + 5)(x - 5)(x + \sqrt{5}i)(x - \sqrt{5}i)$

d. $(x + 5i)(x - 5i)(x + \sqrt{5})(x - \sqrt{5})$

e. $(x + 5i)(x - 5)(x + \sqrt{5i})(x - \sqrt{5})$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.51c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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30. Use the given zero to find all the zeros of the function.

Function	Zero
$7x^3 + 8x^2 + 175x + 200$	$5i$

a. $\pm 5i, \frac{8}{7}$

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b. $\pm 5i, -\frac{8}{7}$

c. $\pm 5i, -8$

d. $\pm 5i, -\frac{7}{8}$

e. $\pm 5i, \pm\frac{8}{7}i$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.56
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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31. Use the given zero to find all the zeros of the function.

Function	Zero
$x^3 - 3x^2 + 16x - 48$	$4i$

a. $\pm 4i, \pm 3$
b. $\pm 4i, -3$
c. $\pm 4i, 3$
d. $4, \pm 3$
e. $\pm 4i, \pm 4$

ANSWER: c
POINTS: 1
REFERENCES: 3.4.55
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:19 PM
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32. Use the given zero to find all the zeros of the function.

Function	Zero
$x^3 + 13x^2 + 59x + 87$	$-5 - 2i$

a. $3, 5 \pm 2i$
b. $\pm 3i, -5 \pm 2i$
c. $-3, 5 \pm 2i$
d. $-3, -5 \pm 2i$

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e. $3, -5 \pm 2i$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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33. Find all the zeros of the function and write the polynomial as a product of linear factors.

$x^2 + 49$

a. $7i; (x + 7i)(x - 7i)$
b. $-7i; (x + 7i)(x - 7i)$
c. $\pm 7i; (x + 7)(x - 7)$
d. $-7i; (x + 7)(x - 7)$
e. $\pm 7i; (x + 7i)(x - 7i)$

ANSWER: e
POINTS: 1
REFERENCES: 3.4.63
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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34. Find all the zeros of the function and write the polynomial as a product of linear factors.

$x^4 - 81$

a. $3, 3i; (x + 3)(x + 3)(x - 3i)(x - 3i)$
b. $\pm 3i; (x - 3i)(x + 3i)$
c. $\pm 3, \pm 3i; (x - 3)(x - 3)(x + 3i)(x + 3i)$
d. $\pm 3; (x - 3)(x + 3)$
e. $\pm 3, \pm 3i; (x - 3)(x + 3)(x - 3i)(x + 3i)$

ANSWER: e
POINTS: 1
REFERENCES: 3.4.67
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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35. Find all the zeros of the function and write the polynomial as a product of linear factors.

$y^4 - 2401$

a. ± 7; $(y - 7)(y + 7)$
b. $\pm 7, \pm 7i$; $(y - 7)(y + 7)(y - 7i)(y + 7i)$
c. $7, 7i$; $(y + 7)(y + 7)(y - 7i)(y - 7i)$
d. $\pm 7i$; $(y - 7i)(y + 7i)$
e. $\pm 7, \pm 7i$; $(y - 7)(y - 7)(y + 7i)(y + 7i)$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.68
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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36. Find all the zeros of the function and write the polynomial as a product of linear factors.

$x^3 - 10x^2 + 29x - 30$

a. $2 \pm i$; 6; $(x - 2 + i)(x + 2 - i)(x - 6)$
b. $2 \pm i$; 6; $(x - 2 + i)(x - 2 + i)(x - 6)$
c. $-2 \pm i$; 6; $(x + 2 + i)(x + 2 - i)(x - 6)$
d. $2 \pm i$; -6; $(x - 2 + i)(x - 2 - i)(x + 6)$
e. $2 \pm i$; 6; $(x - 2 + i)(x - 2 - i)(x - 6)$

ANSWER: e
POINTS: 1
REFERENCES: 3.4.70
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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37. Find all the zeros of the function and write the polynomial as a product of linear factors.

$x^3 - 4x^2 + 13x + 50$

a. $-2, 3 \pm 4i$; $(x + 2)(x - 3 + 4i)(x - 3 - 4i)$
b. $-2, 3 \pm 4i$; $(x + 2)(x - 3 + 4i)(x + 3 - 4i)$
c. $2, 3 \pm 4i$; $(x - 2)(x - 3 + 4i)(x - 3 - 4i)$
d. $-2, 3 \pm 4i$; $(x + 2)(x + 3 + 4i)(x + 3 - 4i)$
e. $-2, 3 \pm 4i$; $(x + 2)(x - 3 - 4i)(x - 3 - 4i)$

ANSWER: a

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POINTS: 1
REFERENCES: 3.4.72
QUESTION TYPE: Multi-Mode (Multiple choice)
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38. Find all the zeros of the function and write the polynomial as a product of linear factors.

$x^4 + 40x^2 + 144$

a. $\pm 6i, \pm 2i; (x + 6i)(x - 6i)(x + 2)(x - 2)$
b. $\pm 6i, \pm 2i; (x + 6i)(x - 6i)(x + 2i)(x - 2i)$
c. $-6i, -2i; (x - 6i)(x - 6i)(x - 2i)(x - 2i)$
d. $6i, 2i; (x + 6i)(x + 6i)(x + 2i)(x + 2i)$
e. $\pm 6i, \pm 2i; (x + 6)(x - 6)(x + 2i)(x - 2i)$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.80
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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39. Find all the zeros of the function.

$x^3 + 8x^2 + 29x + 52$

a. $-3, -4 \pm 2i$
b. $-4, -2 \pm 3i$
c. $-4, 2 \pm 3i$
d. $-4, 2 \pm i$
e. $-4, -3 \pm 2i$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.81
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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40. Write the number of rational and irrational zeros of the given cubic function.

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Section 2.5 - Zeros of Polynomial Functions

$x^3 - 2$

a. Rational zeros: 1; irrational zeros: 0
b. Rational zeros: 1; irrational zeros: 2
c. Rational zeros: 1; irrational zeros: 1
d. Rational zeros: 0; irrational zeros: 1
e. Rational zeros: 0; irrational zeros: 0

ANSWER: d
POINTS: 1
REFERENCES: 3.4.109
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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41. Find all zeros of the function $f(x) = x^2(x - 6)(x^3 - 64)$.

a. $x = 0, -6, -4$
b. $x = 0, 6, 4$
c. $x = 6, 64$
d. $x = -6, -64$
e. $x = 0, 6, 4, -2 - 2\sqrt{3}i, -2 + 2\sqrt{3}i$

ANSWER: e
POINTS: 1
REFERENCES: 3.4.10
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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42. Find all zeros of the function $f(x) = (x - 2)(x + 3i)(x - 3i)$.

a. $x = 2, -3i, 3i$
b. $x = 2$
c. $x = 2, 3i$
d. $x = 2, -3, 3$
e. $x = -2, -3i, 3i$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.13
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.5 - Zeros of Polynomial Functions

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43. Find all zeros of the function $f(x) = (x - 4)(x + 3)[x + (4 + 3i)][x – (4 - 3i)]$.

a. $x = 4, –3, –4 – 3i, 4 – 3i$
b. $x = –4, 3, 4 – 3i, 4 + 3i$
c. $x = –4, 3, 4 + 3i, –4 – 3i$
d. $x = 4, –3, 4 + 3i, –4 + 3i$
e. $x = 4, –3, –4 – 3i, 4 + 3i$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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44. Use the *zero* or *root* feature of a graphing utility to approximate the zeros of the function $f(x) = x^6 - 9x^4 + 11x^2 + 21$ accurate to the nearest thousandth.

a. 2.646, 1.732
b. ±1, –2.646, 1.732
c. $\pm i$, –2.646, –1.732
d. ±1, 2.646, 1.732
e. $\pm i$, ±2.646, ±1.732

ANSWER: e
POINTS: 1
REFERENCES: 3.4.41
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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45. Given $–3i$ is a root, determine all other roots of $f(x) = x^3 - 4x^2 + 9x - 36$.

a. $x = 4, \pm 3$
b. $x = 4, 3i$
c. $x = –3, \pm 4i$
d. $x = \pm 4, 3i$
e. $x = \pm 4, 3$

ANSWER: b
POINTS: 1
REFERENCES: 3.4.55

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Section 2.5 - Zeros of Polynomial Functions

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HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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46. Given $3 + i$ is a root, determine all other roots of $f(x) = x^4 - 12x^3 + 59x^2 - 138x + 130$.

a. $x = 3 - i, 3 \pm 2i$
b. $x = 3 - i, 2 \pm 3i$
c. $x = 3 + i, 3 \pm 2i, 2 - i$
d. $x = 3 - i, 2 \pm i$
e. $x = 3 - i, 3 - 2i, 2 - i$

ANSWER: a
POINTS: 1
REFERENCES: 3.4.57
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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47. Given $3 + i$ is a root, determine all other roots of $f(x) = x^5 - 8x^4 + 24x^3 - 32x^2 + 20x$.

a. $x = 1 - i, 3 - i$
b. $x = 1 - i, 3 - i, 0$
c. $x = 1 + i, 3 - i$
d. $x = 1 \pm i, 3 - i, 0$
e. $x = 1 + i, 3 - i, 0$

ANSWER: d
POINTS: 1
REFERENCES: 3.4.58
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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48. Write $f(x) = x^3 - 5x^2 + 16x - 80$ as a product of linear factors.

a. $f(x) = (x - 5)(x - 4)^2$
b. $f(x) = (x - 5)(x + 4i)(x - 4i)$
c. $f(x) = (x - 5)^2(x - 4i)$
d. $f(x) = (x - 5)(x + 4)^2$
e. $f(x) = (x + 5)(x - 5)(x + 4)$

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ANSWER: b
POINTS: 1
REFERENCES: 3.4.74
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HAS VARIABLES: True
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49. Write $f(x) = x^4 - 2x^3 - x^2 - 38x + 130$ as a product of linear factors.

a. $(x - 3 - i)(x - 3 + i)(x - 2 - 3i)(x - 2 + i)$
b. $(x - 3 + i)(x - 3 - i)(x - 3 + 2i)(x - 3 - 2i)$
c. $(x - 3 - i)(x - 2 + 3i)(x - 2 - 3i)(x - 2 + i)$
d. $(x - 3 - i)(x - 3 + i)(x - 2 - i)(x - 2 + i)$
e. $(x - 3 + i)(x - 3 - i)(x + 2 + 3i)(x + 2 - 3i)$

ANSWER: e
POINTS: 1
REFERENCES: 3.4.77
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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50. Find a polynomial with the given zeros.

$i, \sqrt{7}, -i$

a. $x^3 - 7x$
b. $x^3 - \sqrt{7}x^2 + x - \sqrt{7}$
c. $x^3 - \sqrt{7}x^2 + 7x - \sqrt{7}$
d. $x^3 - 7x^2 + x - 7$
e. none of these

ANSWER: b
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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51. Find a polynomial with real coefficients that has zeros -1, $3i$, and $-3i$.

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a. $x^3 + 9x^2 + x + 9$
b. $x^3 + x^2 - 9x - 9$
c. $x^3 + x^2 + 3x + 3$
d. $x^3 + x^2 + 9x + 9$
e. $x^3 - x^2 + 9x - 9$

ANSWER: d
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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52. Given $-2i$ is a root, determine all other roots of $f(x) = x^3 + 3x^2 + 4x + 12$.

a. $x = \pm 3, 2i$
b. $x = -2, \pm 3i$
c. $x = -3, \pm 2$
d. $x = -3, 2i$
e. $x = \pm 3, 2$

ANSWER: d
POINTS: 1
REFERENCES: 129
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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53. Given that $x = 5 - 3i$ is a zero of $f(x) = x^3 - 4x^2 - 26x + 204$, find all the zeros of f.

a. $x = 5 - 3i, -5 + 3i, -6$
b. $x = 5 - 3i, 5 + 3i, -3$
c. $x = 5 - 3i, 5 + 3i, -6$
d. $x = 5 - 3i, -5 - 3i, -3$
e. $x = 5 - 3i, -5 + 3i, -3$

ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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Section 2.6 - Rational Functions

1. Determine the equations of the vertical and horizontal asymptotes of the graph of the function $f(x) = \frac{1}{x-3}$.

a. horizontal: $y = 1$; vertical: $x = 3$
b. horizontal: $x = 0$; vertical: $y = 3$
c. horizontal: $y = -3$; vertical: $x = 0$
d. horizontal: $x = 3$; vertical: $y = -1$
e. horizontal: $y = 0$; vertical: $x = 3$

ANSWER: e
POINTS: 1
REFERENCES: 2.6.5b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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2. Find the domain of the function $f(x) = \frac{9}{x-8}$.

a. Domain: all real numbers x except $x = 8$
b. Domain: all real numbers x except $x = 9$
c. Domain: all real numbers x except $x = -9$
d. Domain: all real numbers x
e. Domain: all real numbers x except $x = -8$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.5a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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3. Determine the equations of the vertical and horizontal asymptotes of the graph of the function $f(x) = \frac{x}{x-4}$.

a. horizontal: $y = 0$; vertical: $x = 4$
b. horizontal: $y = -4$; vertical: $x = 0$
c. horizontal: $x = 0$; vertical: $y = 4$
d. horizontal: $x = 4$; vertical: $y = -1$
e. horizontal: $y = 1$; vertical: $x = 4$

ANSWER: e
POINTS: 1

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Section 2.6 - Rational Functions

REFERENCES: 2.6.6b
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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4. Find the domain of the function $f(x) = \dfrac{6x^2}{x^2 - 25}$.

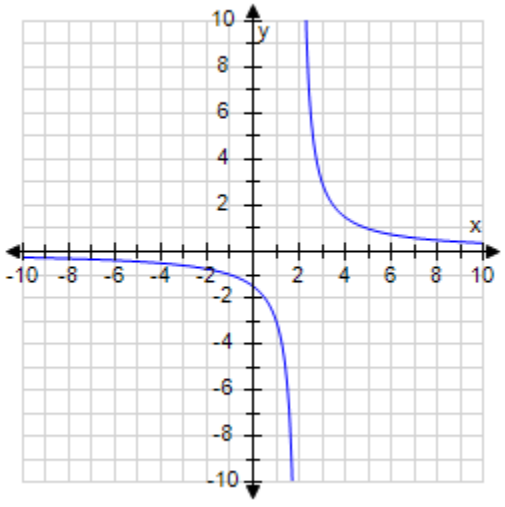
a. Domain: all real numbers x except $x = 5$
b. Domain: all real numbers x except $x = \pm 25$
c. Domain: all real numbers x except $x = \pm 6$
d. Domain: all real numbers x except $x = -5$
e. Domain: all real numbers x except $x = \pm 5$

ANSWER: e
POINTS: 1
REFERENCES: 4.1.7a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 10/6/2014 8:40 AM

5. The graph of the function

$$f(x) = \frac{3}{x - 2}$$

is shown below. Determine the vertical and horizontal asymptotes of its graph.



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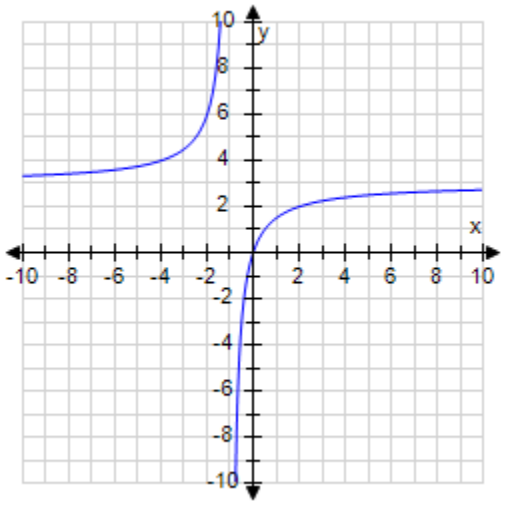
a. horizontal: $y = 0$; vertical: $x = 2$
b. horizontal: $y = 0$; vertical: $x = -2$
c. horizontal: $y = -2$; vertical: $x = 0$
d. horizontal: $y = 2$; vertical: $x = 0$
e. horizontal: $y = -2$; vertical: $x = 2$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.7b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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6. The graph of the function

$$f(x) = \frac{3x}{x + 1}$$

is shown below. Determine the domain.



a. Domain: all real numbers except $x = -1$
b. Domain: all real numbers except $x = -3$
c. Domain: all real numbers except $x = 3$
d. Domain: all real numbers except $x = 1$
e. Domain: all real numbers except $x = 0$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.7c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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Section 2.6 - Rational Functions

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7. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{25}{x^2}$$

a. Domain: all real numbers x except $x = 0$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

b. Domain: all real numbers x except $x = 5$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

c. Domain: all real numbers x except $x = 25$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

d. Domain: all real numbers x
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

e. Domain: all real numbers x except $x = \pm 5$
Vertical asymptote: $y = 0$
Horizontal asymptote: $x = 0$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.9
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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8. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{9}{(x-3)^3}$$

a. Domain: all real numbers x
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

b. Domain: all real numbers x except $x = 9$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

c. Domain: all real numbers x except $x = 3$
Vertical asymptote: $x = 0$

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Horizontal asymptote: $y = 9$

d. Domain: all real numbers x
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 9$

e. Domain: all real numbers x except $x = 3$
Vertical asymptote: $x = 3$
Horizontal asymptote: $y = 0$

ANSWER: e
POINTS: 1
REFERENCES: 4.1.10
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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9. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{7+x}{7-x}$$

a. Domain: all real numbers x except $x = 7$
Vertical asymptote: $x = 7$
Horizontal asymptote: $y = -1$

b. Domain: all real numbers x
Vertical asymptote: $x = -7$
Horizontal asymptote: $y = 0$

c. Domain: all real numbers x except $x = 0$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -1$

d. Domain: all real numbers x except $x = 7$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -7$

e. Domain: all real numbers x except $x = -7$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 7$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.6 - Rational Functions

10. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{x^3}{x^2 - 49}$$

a. Domain: all real numbers x except $x = 0$
Vertical asymptotes: $x = 7$ and $x = -7$
Horizontal asymptote: No horizontal asymptote

b. Domain: all real numbers x except $x = \pm 7$
Vertical asymptotes: $x = 7$ and $x = -7$
Horizontal asymptote: No horizontal asymptote

c. Domain: all real numbers x except $x = 7$
Vertical asymptote: $x = 7$
Horizontal asymptote: $y = 7$

d. Domain: all real numbers x
Vertical asymptote: $x = -7$
Horizontal asymptote: $y = 0$

e. Domain: all real numbers x except $x = 0$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -49$

ANSWER: b
POINTS: 1
REFERENCES: 4.1.13
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/28/2021 9:51 AM

11. Determine the domain of the function $f(x) = \frac{5}{(x + 3)^3}$.

a. Domain: all real numbers x except $x = -5$ and $x = 3$

b. Domain: all real numbers x

c. Domain: all real numbers x except $x = -5$ and $x = -3$

d. Domain: all real numbers x except $x = -3$

e. Domain: all real numbers x except $x = 5$ and $x = -3$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.10
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.6 - Rational Functions

12. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{2x^2}{x+3}$$

a. Domain: all real numbers x except $x = 0$
   Vertical asymptote: $x = 0$
   Horizontal asymptote: $y = -2$
b. Domain: all real numbers x except $x = -3$
   Vertical asymptote: $x = -3$
   Horizontal asymptote: No horizontal asymptote
c. Domain: all real numbers x except $x = 3$
   Vertical asymptote: $x = 3$
   Horizontal asymptote: No horizontal asymptote
d. Domain: all real numbers x except $x = 3$
   Vertical asymptote: $x = 3$
   Horizontal asymptote: $y = 2$
e. Domain: all real numbers x
   Vertical asymptote: $x = -3$
   Horizontal asymptote: $y = 0$

ANSWER: b
POINTS: 1
REFERENCES: 4.1.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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13. Find the domain of the function.

$$f(x) = \frac{-9x}{x-5}$$

a. $x = 5$
b. all real numbers x except $x = 5$ and $x = 0$
c. $x = 5, x = 0$
d. all real numbers x except $x = 5$
e. $\varnothing$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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14. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{5x^2 + 8}{x^2 + x + 9}$$

a. Domain: all real numbers x
Vertical asymptote: No vertical asymptote
Horizontal asymptote: $y = 5$

b. Domain: all real numbers x except $x = 0$
Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -8$

c. Domain: all real numbers x
Vertical asymptote: $x = -5$
Horizontal asymptote: $y = 0$

d. Domain: all real numbers x except $x = 5$
Vertical asymptote: No vertical asymptote
Horizontal asymptote: No horizontal asymptote

e. Domain: all real numbers x except $x = 9$
Vertical asymptote: $x = 5$
Horizontal asymptote: $y = 8$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.15
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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15. Determine the equations of the vertical and horizontal asymptotes of the graph of the function $f(x) = \frac{5x^2}{x^2 - 9}$

.

a. horizontal: $y = -3$; vertical: $x = 5$

b. horizontal: $x = 3$ and $x = -3$; vertical: $y = -5$

c. horizontal: $y = 5$; vertical: $x = 3$ and $x = -3$

d. horizontal: $x = -5$; vertical: $y = 3$ and $y = -3$

e. horizontal: $y = 5$; vertical: $x = 3$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.13
QUESTION TYPE: Multi-Mode (Multiple choice)

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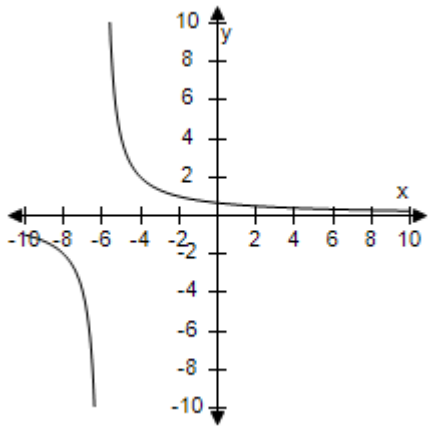
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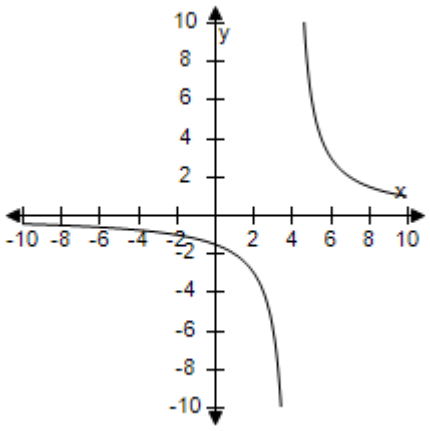
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STUDENT ENTRY MODE: Basic
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16. Select the correct graph of the function $f(x) = \dfrac{6}{x+4}$.

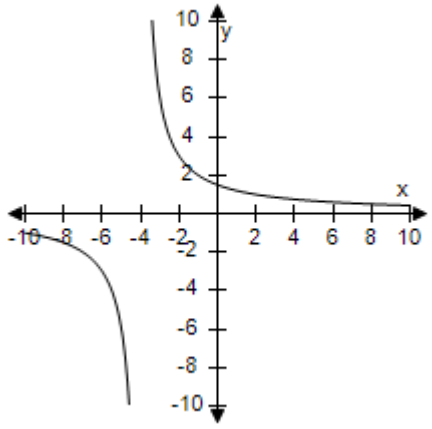
a.



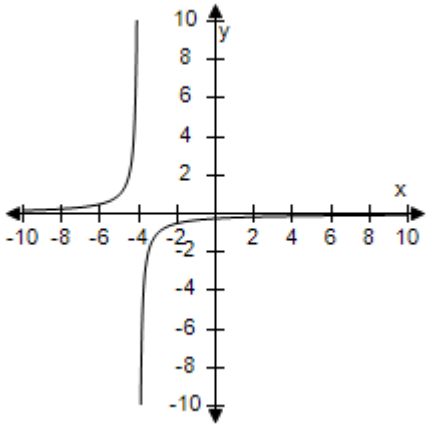
b.



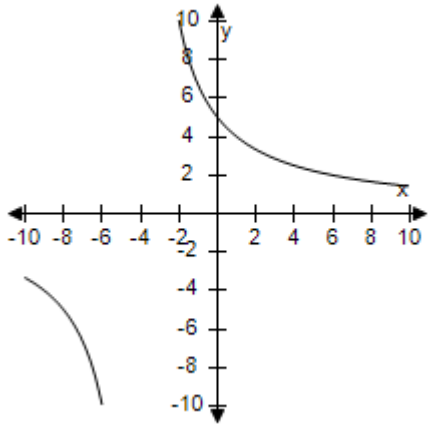
c.



d.



e.



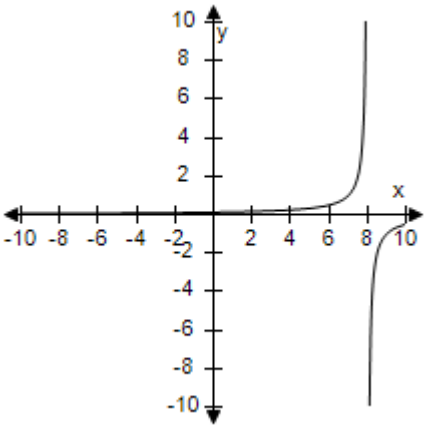
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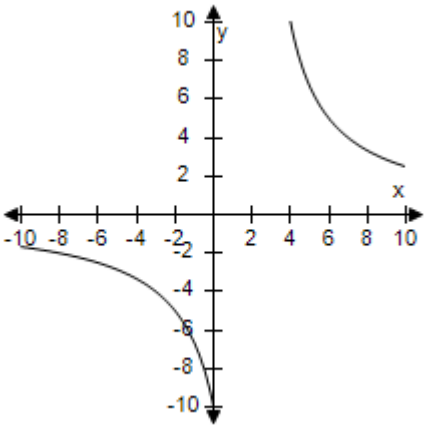
ANSWER: c
POINTS: 1
REFERENCES: 4.1.17
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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17. Select the correct graph of the function $f(x) = \dfrac{8}{x-2}$.

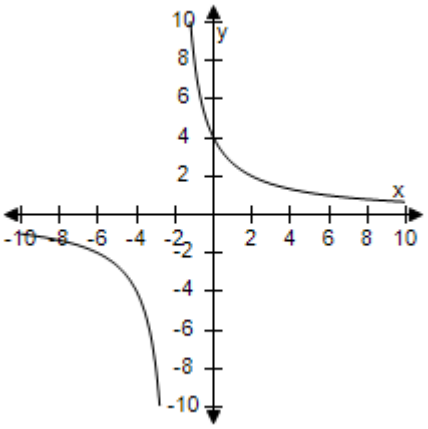
a.



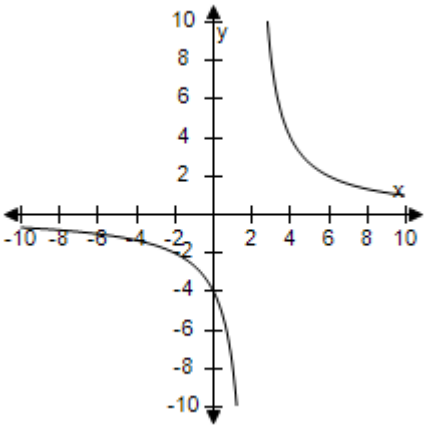
b.



c.



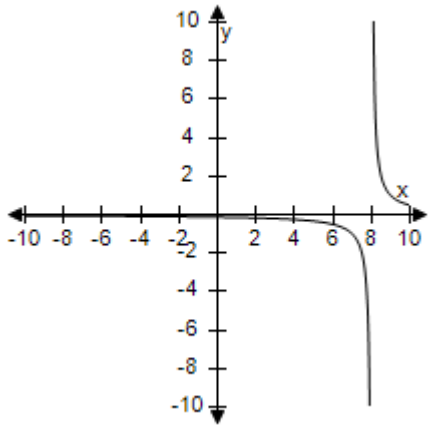
d.



e.

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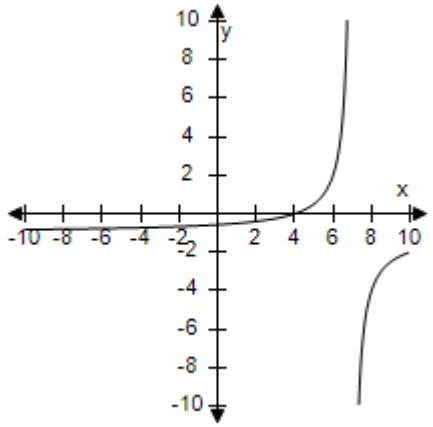
Section 2.6 - Rational Functions



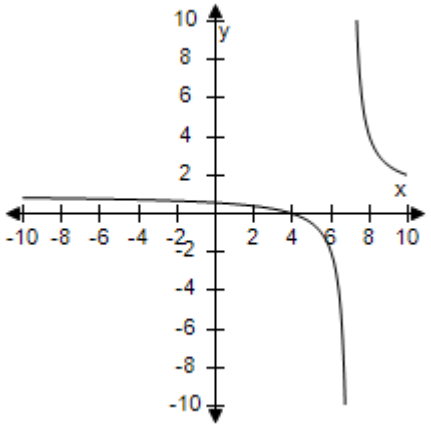
ANSWER: d
POINTS: 1
REFERENCES: 4.1.18
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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18. Select the correct graph of the function $f(x) = \dfrac{x-4}{x-7}$.

a.



b.

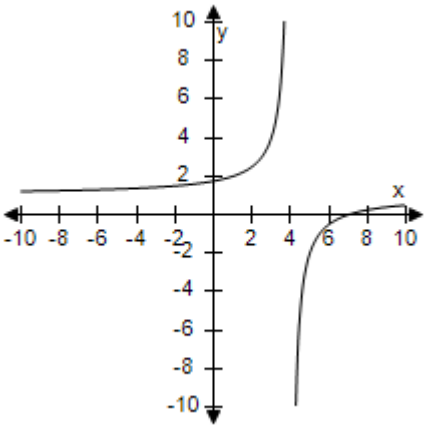


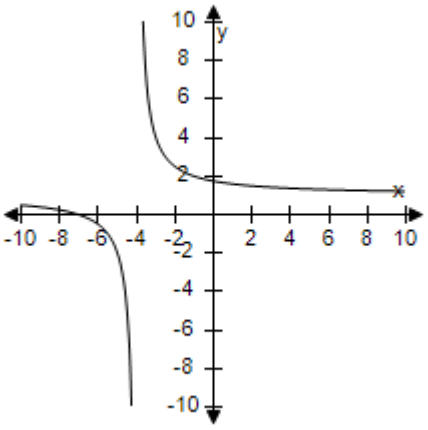
c.

d.

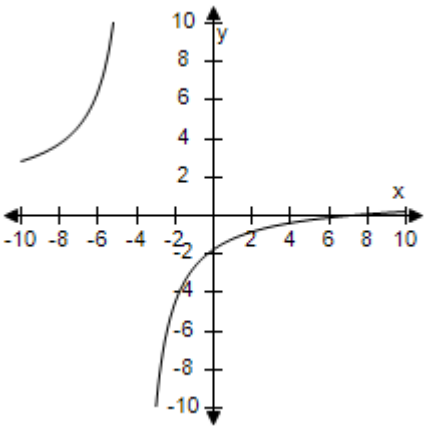
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e.

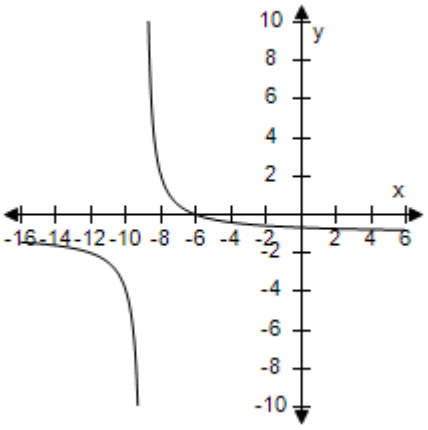


ANSWER: b
POINTS: 1
REFERENCES: 4.1.19
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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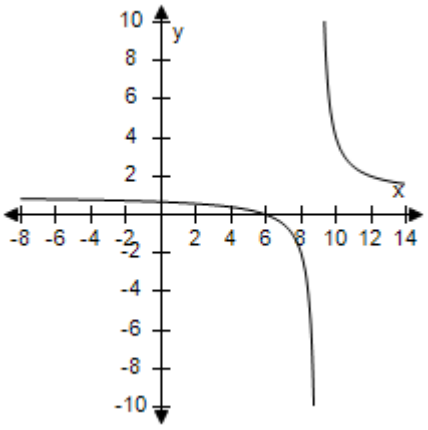
19. Select the graph of the rational function $f(x) = -\dfrac{x+6}{x+9}$.

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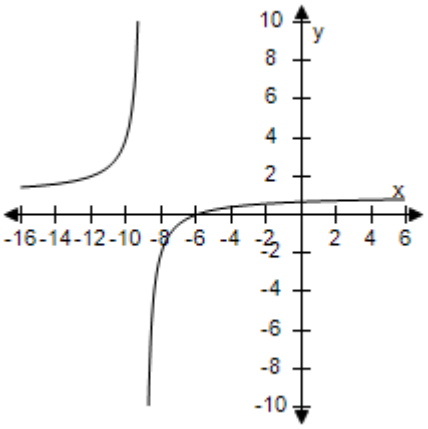
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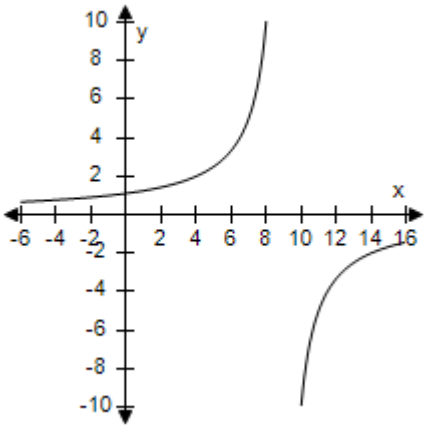
b.



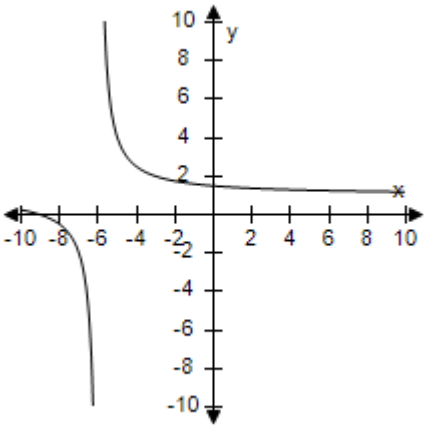
c.



d.



e.



ANSWER: a
POINTS: 1
REFERENCES: 4.1.20
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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20. Find the zeros (if any) of the rational function.

$$g(x) = \frac{x^2 - 25}{x + 5}$$

a. –25
b. ±5
c. –5
d. 25
e. 5

ANSWER: e
POINTS: 1
REFERENCES: 4.1.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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21. Determine the zeros (if any) of the rational function $f(x) = \frac{x^2 - 9}{x - 9}$.

a. $x = -9, x = 9$
b. no zeros
c. $x = 4$
d. $x = \frac{3}{4}, x = -\frac{3}{4}$
e. $x = -3, x = 3$

ANSWER: e
POINTS: 1
REFERENCES: 4.1.22
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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22. Find the zeros (if any) of the rational function.

$$f(x) = 2 + \frac{12}{x^2 + 2}$$

a. –2

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b. 2
c. 8
d. –8
e. no zeros

ANSWER: e
POINTS: 1
REFERENCES: 4.1.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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23. Determine the zeros (if any) of the rational function $g(x) = 7 + \frac{4}{x^2 + 7}$.

a. $x = -7, x = 7$
b. $x = -\sqrt{7}, x = \sqrt{7}$
c. $x = -\frac{4}{7}, x = \frac{4}{7}$
d. $x = -4$
e. no zeros

ANSWER: e
POINTS: 1
REFERENCES: 4.1.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 12:48 PM

24. Find the zeros (if any) of the rational function.

$$f(x) = 1 + \frac{6}{x^2 - 7}$$

a. ±7
b. ±6
c. 6
d. ±1
e. 7

ANSWER: d
POINTS: 1

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REFERENCES: 4.1.24
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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25. Find the zeros (if any) of the rational function.

$$f(x) = 1 - \frac{8}{x-8}$$

a. 8
b. –1
c. –16
d. 1
e. 16

ANSWER: e
POINTS: 1
REFERENCES: 4.1.25
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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26. Find the zeros (if any) of the rational function.

$$g(x) = \frac{x^3 - 8}{x^2 + 1}$$

a. 8
b. –8
c. 2
d. –1
e. –2

ANSWER: c
POINTS: 1
REFERENCES: 4.1.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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27. Determine the zeros (if any) of the rational function $g(x) = \dfrac{x^3 - 8}{x^2 + 6}$.

a. $x = -\sqrt{6}, x = \sqrt{6}, x = 2$

b. no zeros

c. $x = -2, x = 2$

d. $x = 2$

e. $x = -\sqrt{6}, x = \sqrt{6}, x = -2, x = 2$

ANSWER: d
POINTS: 1
REFERENCES: 4.1.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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28. Find the zeros (if any) of the rational function.

$$f(x) = \frac{x^3 - 2{,}744}{x^2 + 64}$$

a. 2,744

b. –2,744

c. –14

d. 14

e. –8

ANSWER: d
POINTS: 1
REFERENCES: 4.1.28
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 10/15/2014 7:42 AM

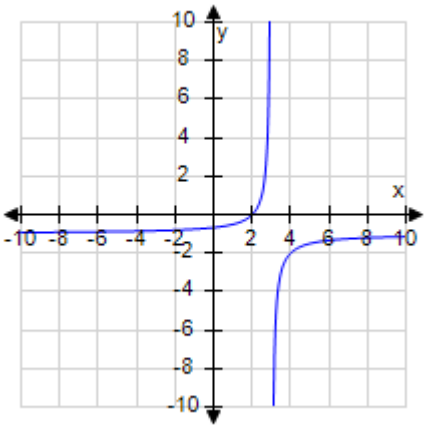
29. Which of the following is the graph of the given function?

$$f(x) = \frac{x - 2}{x - 3}$$

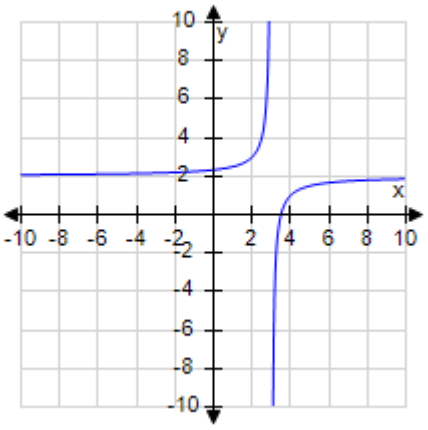
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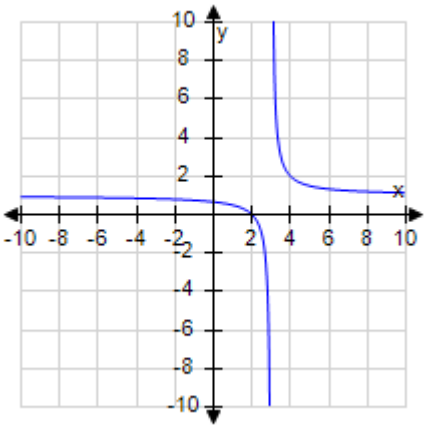
a.



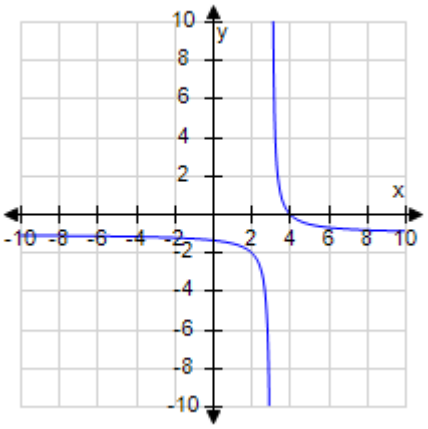
b.



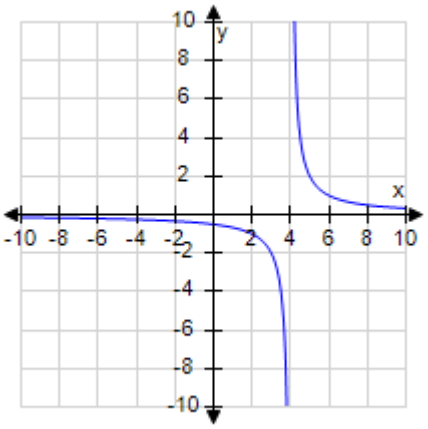
c.



d.



e.

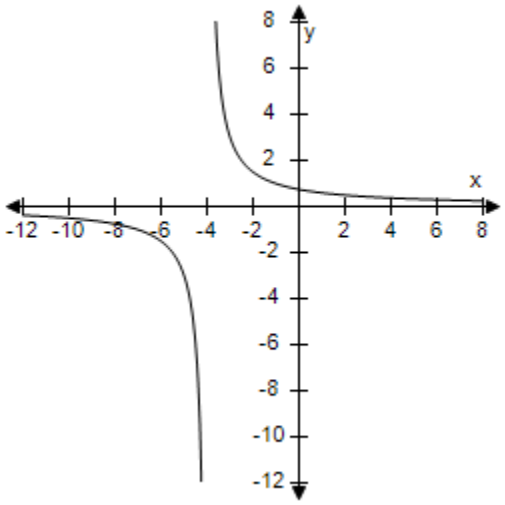


ANSWER: c
POINTS: 1
REFERENCES: 2.6.17
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.6 - Rational Functions

30. Select the correct rational function for the following graph.



a. $f(x)=\frac{3}{x-4}$

b. $f(x)=\frac{3}{x+4}$

c. $f(x)=\frac{3}{x+3}$

d. $f(x)=\frac{4}{x-3}$

e. $f(x)=\frac{4}{x-4}$

ANSWER:	b
POINTS:	1
REFERENCES:	2.6.17
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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DATE MODIFIED:	10/15/2014 10:08 AM

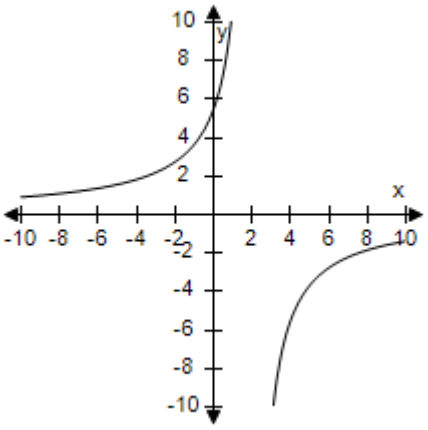
31. Select the correct graph for the following rational function.

$f(x)=\frac{11}{x-8}$

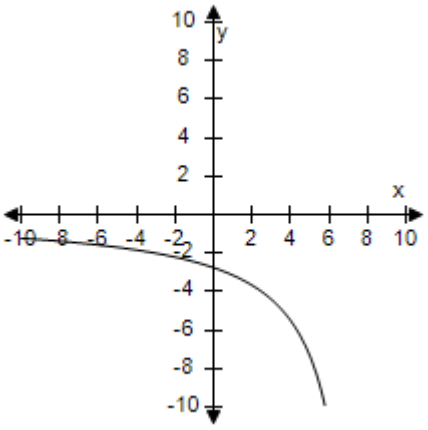
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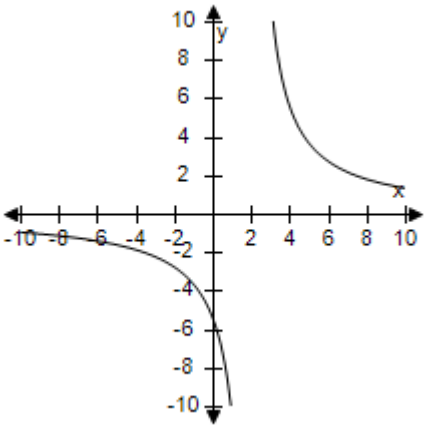
a.



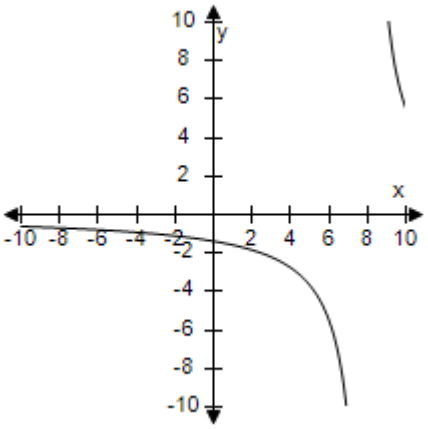
b.



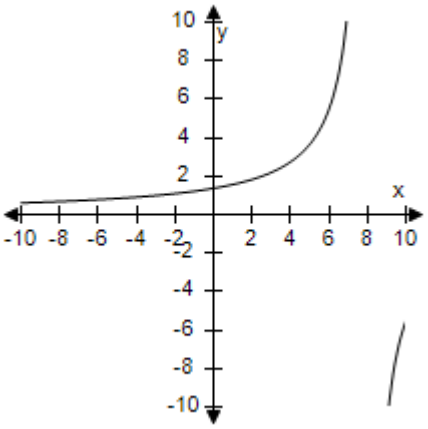
c.



d.



e.



ANSWER:	d
POINTS:	1
REFERENCES:	2.6.18
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:20 PM
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32. Determine the zeros (if any) of the rational function $f(x) = \dfrac{x^2 - 9}{x + 4}$.

a. no zeros
b. $x = -\dfrac{3}{4}, x = \dfrac{3}{4}$
c. $x = -4$
d. $x = -9, x = 9$
e. $x = -3, x = 3$

ANSWER: e
POINTS: 1
REFERENCES: 2.6.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 4:55 PM

33. Find the zeros of the rational function.

$$g(x) = \frac{x^2 - 9}{x + 3}$$

a. $x = 0$
b. $x = -9$
c. $x = 3$
d. $x = 9$
e. $x = -3$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.21
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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34. Determine the zeros (if any) of the rational function $g(x) = 6 + \dfrac{4}{x^2 + 6}$.

a. no zeros
b. $x = -\sqrt{6}, x = \sqrt{6}$
c. $x = -6, x = 6$
d. $x = -\dfrac{2}{3}, x = \dfrac{2}{3}$
e. $x = -4$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.22
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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35. Find the zeros of the rational function.

$$f(x) = 1 - \frac{5}{x - 10}$$

a. $x = -15$
b. $x = -5$
c. $x = 15$
d. $x = -10$
e. $x = 5$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.23
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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36. Find the domain of $f(x) = \dfrac{x + 5}{x^2 - 25}$.

a. all real numbers except $x = -5$
b. all real numbers
c. all real numbers except $x = -5$ and $x = 5$
d. all real numbers except $x = 25$
e. all real numbers except $x = 5$

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ANSWER: c
POINTS: 1
REFERENCES: 2.6.25
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/28/2021 4:59 PM

37. Find the vertical asymptotes of the following function.

$$g(x) = \frac{x-5}{x^2-25}$$

a. $x = 25$
b. $x = -5$
c. $x = -25$
d. $x = 5$
e. $x = 0$

ANSWER: b
POINTS: 1
REFERENCES: 2.6.25b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 5:01 PM

38. Determine the equations of any horizontal and vertical asymptotes of $f(x) = \frac{x-7}{x^2-49}$.

a. horizontal: $y = 0$; vertical: $x = -7$
b. horizontal: $y = -7$; vertical: $x = 0$
c. horizontal: $y = 7$; vertical: $x = -7$
d. horizontal: $y = 0$; vertical: $x = 7$
e. horizontal: $y = 0$; vertical: none

ANSWER: a
POINTS: 1
REFERENCES: 2.6.26
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.6 - Rational Functions

39. Determine the domain of the function $f(x) = \dfrac{x^2 - 4}{x^2 + 6x + 8}$.

a. Domain: all real numbers except $x = 2$ and $x = 4$
b. Domain: all real numbers except $x = -2$ and $x = 4$
c. Domain: all real numbers except $x = -2$ and $x = -4$
d. Domain: all real numbers except $x = 4$
e. Domain: all real numbers

ANSWER: c
POINTS: 1
REFERENCES: 2.6.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/28/2021 5:05 PM

40. Find the domain of the following function.
$g(x) = \dfrac{x^2 - 25}{x^2 - 4x - 5}$

a. all real numbers x except $x = -25$ and $x = -1$
b. all real numbers x except $x = -4$ and $x = 5$
c. all real numbers x except $x = 4$ and $x = 25$
d. all real numbers x except $x = 5$ and $x = -1$
e. all real numbers x except $x = -5$ and $x = 1$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.27a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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41. Find the domain of $f(x) = \dfrac{x^2 - 16}{x^2 + 4x - 32}$.

a. all real numbers
b. all real numbers except $x = -8$
c. all real numbers except $x = 4$ and $x = -8$
d. all real numbers except $x = 8$ and $x = -4$
e. all real numbers except $x = -4$, $x = 4$, and $x = -8$

ANSWER: c

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POINTS: 1
REFERENCES: 2.6.28
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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42. Find the domain of the following function.

$$g(x) = \frac{x^2 - 4}{x^2 - 3x + 2}$$

a. all real numbers x except $x = -4$ and $x = -1$
b. all real numbers x except $x = -3$ and $x = 2$
c. all real numbers x except $x = 3$ and $x = 4$
d. all real numbers x except $x = 2$ and $x = 1$
e. all real numbers x except $x = -2$ and $x = 1$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.28a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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43. Find the domain of the following function.

$$g(x) = \frac{1}{x + 7}$$

a. all real numbers x except $x = -7$
b. all real numbers x except $x = 1$
c. all real numbers x except $x = 49$
d. all real numbers x except $x = 7$
e. all real numbers x except $x = -1$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.31a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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44. Find all intercepts of the following function.

$$g(x) = \frac{1}{x-4}$$

a. y-intercept: $\left(0, \frac{1}{4}\right)$

b. x-intercept: $\left(-\frac{1}{4}, 0\right)$

c. y-intercept: $\left(0, -\frac{1}{4}\right)$

d. x-intercept: $\left(\frac{1}{4}, 0\right)$

e. x-intercept: $\left(-\frac{1}{4}, 0\right)$ and y-intercept: $\left(0, -\frac{1}{4}\right)$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.32b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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45. Find all intercepts of the following function.

$$g(x) = \frac{-1}{x+3}$$

a. x-intercept: $\left(-\frac{1}{3}, 0\right)$

b. y-intercept: $\left(0, -\frac{1}{3}\right)$

c. x-intercept: $\left(-\frac{1}{3}, 0\right)$ and y-intercept: $\left(0, -\frac{1}{3}\right)$

d. x-intercept: $\left(\frac{1}{3}, 0\right)$

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e. y-intercept: $\left(0, \frac{1}{3}\right)$

ANSWER: b
POINTS: 1
REFERENCES: 2.6.33b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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46. Find the vertical and horizontal asymptotes.

$$f(x) = \frac{1}{x-7}$$

a. Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 7$
b. Vertical asymptote: $x = -7$
Horizontal asymptote: $y = 1$
c. Vertical asymptote: $x = -7$
Horizontal asymptote: $y = 0$
d. Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -7$
e. Vertical asymptote: $x = 7$
Horizontal asymptote: $y = 0$

ANSWER: e
POINTS: 1
REFERENCES: 2.6.34c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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47. Find the vertical and horizontal asymptotes.

$$f(x) = \frac{9+6x}{6+x}$$

a. Vertical asymptote: $x = -6$
Horizontal asymptote: $y = 6$
b. Vertical asymptote: $x = 0$
Horizontal asymptote: $y = -6$
c. Vertical asymptote: $x = 6$

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Horizontal asymptote: $y = -6$

d. Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 6$

e. Vertical asymptote: $x = -6$
Horizontal asymptote: $y = 0$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.35c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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48. Find the domain of the following function.

$$g(x) = \frac{1 - 9x}{1 - x}$$

a. all real numbers x
b. all real numbers x except $x = 1$
c. all real numbers x except $x = -9$
d. all real numbers x except $x = -1$
e. all real numbers x except $x = 9$

ANSWER: b
POINTS: 1
REFERENCES: 2.6.36a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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49. Find the domain of the following function.

$$f(x) = \frac{x^2}{x^2 + 36}$$

a. all real numbers x except $x = 36$
b. all real numbers x
c. all real numbers x except $x = 0$
d. all real numbers x except $x = 6$
e. all real numbers x except $x = -1$

ANSWER: b

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POINTS: 1
REFERENCES: 2.6.37a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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50. Identify all intercepts of $f(x) = \dfrac{x^2}{x^2 + 4}$.

a. x-intercept: none; y-intercept: (0, 3)
b. x-intercept: none; y-intercept: (0, 1)
c. x-intercept: none; y-intercept: none
d. x-intercept: (0, 0); y-intercept: (0, 0)
e. x-intercepts: (–2, 0) and (2, 0); y-intercept: (0, 1)

ANSWER: d
POINTS: 1
REFERENCES: 2.6.37b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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51. Determine the equations of any horizontal and vertical asymptotes of $f(x) = \dfrac{x^2}{x^2 + 16}$.

a. horizontal: $y = 4$; vertical: $x = –4$
b. horizontal: $x = 1$; vertical: none
c. horizontal: none; vertical: none
d. horizontal: $y = 1$; vertical: none
e. horizontal: $y = –4$; vertical: $x = 1$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.37c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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52. Find all intercepts of the following function.

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Section 2.6 - Rational Functions

$$f(t) = \frac{1 - 8t}{t}$$

a. $\left(-\frac{1}{8}, 0\right)$

b. (0, 8)

c. (8, 0)

d. $\left(\frac{1}{8}, 0\right)$

e. $\left(0, \frac{1}{8}\right)$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.38b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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53. Find all intercepts of the following function.

$$g(s) = \frac{5s}{s^2 + 5}$$

a. (0, 0)

b. (5, 0)

c. (–5, 0)

d. (0, –5)

e. (0, 5)

ANSWER: a
POINTS: 1
REFERENCES: 2.6.39b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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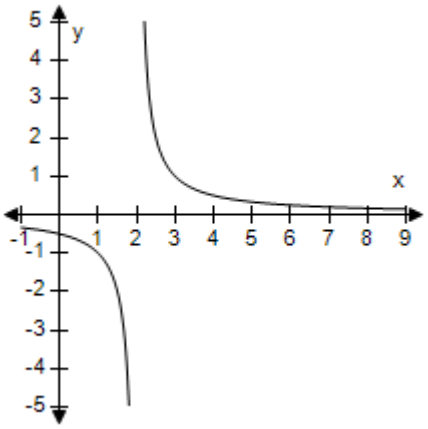
54. Select the correct graph of the following function.

$$f(x) = -\frac{1}{(x-2)^2}$$

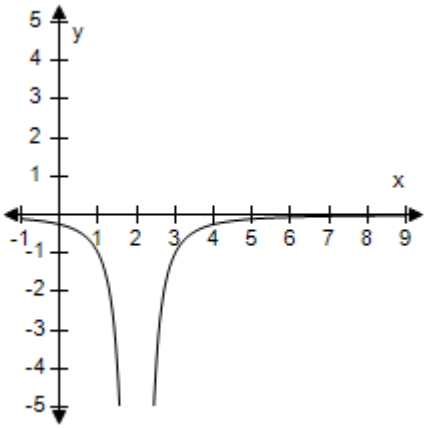
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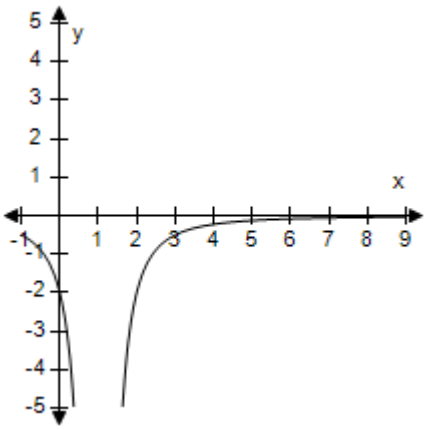
a.



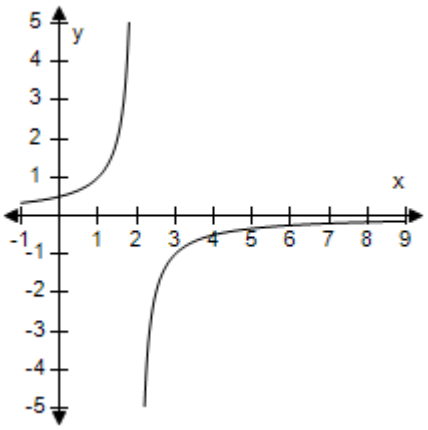
b.



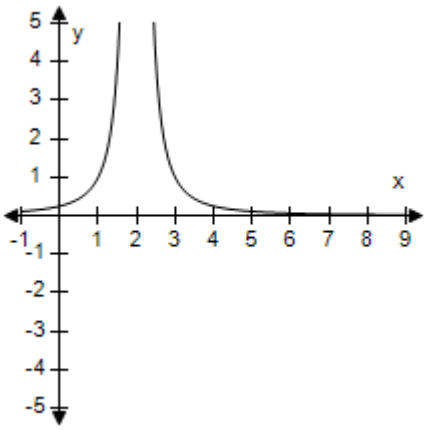
c.



d.



e.



ANSWER:	b
POINTS:	1
REFERENCES:	2.6.40d
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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55. Find the domain of the function and identify any vertical and horizontal asymptotes.

$$f(x) = \frac{x-2}{x^2-4}$$

a. The domain is all real numbers x except $x = \pm 2$. There is a vertical asymptote at $x = -2$, and a horizontal asymptote at $y = 0$.
b. The domain is all real numbers x except $x = \pm 2$. There is a vertical asymptote at $x = -2$, and a horizontal asymptote at $y = \frac{1}{2}$.
c. The domain is all real numbers x. There is a vertical asymptote at $x = -4$, and a horizontal asymptote at $y = 0$.
d. The domain is all real numbers x except $x = \pm 4$. There is a vertical asymptote at $x = -4$, and a horizontal asymptote at $y = 0$.
e. The domain is all real numbers x except $x = \pm 4$. There is a vertical asymptote at $x = -2$, and no horizontal asymptote.

ANSWER: a
POINTS: 1
REFERENCES: 4.1.29
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 8:38 PM

56. Find the domain of $f(x) = \frac{x+3}{x^2-9}$.

a. all real numbers except $x = 3$
b. all real numbers except $x = 9$
c. all real numbers except $x = -3$
d. all real numbers except $x = -3$ and $x = 3$
e. all real numbers

ANSWER: d
POINTS: 1
REFERENCES: 4.1.29
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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57. Find the domain of the function and identify any vertical and horizontal asymptotes.

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$$f(x) = \frac{x+4}{x^2-16}$$

a. The domain is all real numbers x except $x = \pm 4$. There is a vertical asymptote at $x = -4$, and a horizontal asymptote at $y = 0$.
b. The domain is all real numbers x except $x = \pm 4$. There is a vertical asymptote at $x = -16$, and a horizontal asymptote at $y = 0$.
c. The domain is all real numbers x except $x = \pm 16$. There is a vertical asymptote at $x = -16$, and a horizontal asymptote at $y = 0$.
d. The domain is all real numbers x except $x = \pm 4$. There is a vertical asymptote at $x = 4$, and a horizontal asymptote at $y = 0$.
e. The domain is all real numbers x except $x = \pm 16$. There is a vertical asymptote at $x = -4$, and a horizontal asymptote at $y = 0$.

ANSWER: d
POINTS: 1
REFERENCES: 4.1.30
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 11/11/2014 7:36 AM

58. Determine the domain of $f(x) = \frac{2x + 2}{x^2 - 2x}$.

a. all real numbers except $x = 0$ and $x = 2$
b. all real numbers
c. all real numbers except $x = 2$
d. all real numbers except $x = -2$ and $x = -1$
e. all real numbers except $x = -1$, $x = 0$, and $x = 2$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.30
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 8:42 PM

59. Determine the equations of any horizontal and vertical asymptotes of $f(x) = \frac{x^2 - 9}{x^2 + 3x - 18}$.

a. horizontal: $y = 6$; vertical: $x = 0$
b. horizontal: $y = 1$; vertical: $x = -6$

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c. horizontal: $y = 1$; vertical: $x = 3$ and $x = -6$
d. horizontal: $y = -3$; vertical: $x = -6$
e. horizontal: $y = 0$; vertical: none

ANSWER: b
POINTS: 1
REFERENCES: 4.1.31
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 8:43 PM

60. Find the domain of $f(x) = \dfrac{x^2 - 9}{x^2 + 3x - 18}$.

a. all real numbers except $x = 6$ and $x = -3$
b. all real numbers
c. all real numbers except $x = 3$ and $x = -6$
d. all real numbers except $x = -3$, $x = 3$, and $x = -6$
e. all real numbers except $x = -6$

ANSWER: c
POINTS: 1
REFERENCES: 4.1.32
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 5/28/2021 8:45 PM

61. Determine the equations of any horizontal and vertical asymptotes of $f(x) = \dfrac{5x^2 - 3x - 4}{x^2 + 2x + 2}$.

a. horizontal: $y = 5$; vertical: $x = 0$
b. horizontal: $y = -2$; vertical: $x = -5$
c. horizontal: $y = 5$; vertical: none
d. horizontal: $y = 1$; vertical: $x = -2$
e. horizontal: $y = -5$; vertical: $x = 2$ and $x = -5$

ANSWER: c
POINTS: 1
REFERENCES: 4.1.35
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.6 - Rational Functions

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62. Find the domain of $f(x) = \dfrac{-2x^2 - x - 9}{x^2 + 3x + 3}$.

a. all real numbers
b. all real numbers except $x = -3$
c. all real numbers except $x = 9$
d. all real numbers except $x = -1$
e. all real numbers except $x = -3$ and $x = 2$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.36
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 10:47 AM

63. Determine the domain of $f(x) = \dfrac{x^2 + 9x + 18}{x^3 + 6x^2 - x - 6}$.

a. all real numbers except $x = -6$ and $x = -3$
b. all real numbers except $x = -1$, $x = 1$, $x = -6$, and $x = -3$
c. all real numbers except $x = 6$
d. all real numbers except $x = -1$, $x = 1$ and $x = -6$
e. all real numbers

ANSWER: d
POINTS: 1
REFERENCES: 2.6.44a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 10:49 AM

64. Identify all intercepts of $f(x) = \dfrac{x^2 + 10x + 24}{x^3 + 6x^2 - x - 6}$.

a. x-intercept: none; y-intercept: none
b. x-intercept: $\left(-\dfrac{5}{3}, 0\right)$; y-intercept: none

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c. x-intercept: $(-4, 0)$; y-intercept: $(0, -4)$
d. x-intercepts: $(-6, 0)$, $(-1, 0)$, $(1, 0)$; y-intercept: $(0, -4)$
e. x-intercept: $(0, 0)$; y-intercept: $(0, 0)$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.44b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 10:51 AM

65. Determine the equations of any horizontal and vertical asymptotes of $f(x) = \dfrac{x^2 + 6x + 8}{x^3 + 4x^2 - x - 4}$.

a. horizontal: $y = 1$; vertical: $x = -4$
b. horizontal: $y = 0$; vertical: $x = 1$ and $x = -4$
c. horizontal: $y = 0$; vertical: $x = -1$ and $x = 1$
d. horizontal: none; vertical: none
e. horizontal: $y = 0$; vertical: $x = -4$ and $x = -2$

ANSWER: c
POINTS: 1
REFERENCES: 2.6.44c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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66. Determine the domains of f and g.

$f(x) = \dfrac{x^2 - 16}{x + 4}$, $g(x) = x - 4$

a. Domain of f: all real numbers x except $x = -4$
Domain of g: all real numbers x
b. Domain of f: all real numbers x except $x = \pm 4$
Domain of g: all real numbers x
c. Domain of f: all real numbers x except $x = \pm 16$
Domain of g: all real numbers x except $x = 4$
d. Domain of f: all real numbers x except $x = 4$
Domain of g: all real numbers x
e. Domain of f: all real numbers x except $x = \pm 4$

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Domain of g: all real numbers x except $x = 4$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.37a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 10:56 AM

67. Given $f(x) = \dfrac{x^2 + 49}{x + 7}$, $g(x) = x - 7$, determine the domains of $f(x)$ and $g(x)$.

a. Domain of $f(x)$: all real numbers x except $x = -7$
   Domain of $g(x)$: all real numbers x except $x = 7$
b. Domain of $f(x)$: all real numbers x
   Domain of $g(x)$: all real numbers x except $x = 7$
c. Domain of $f(x)$: all real numbers x
   Domain of $g(x)$: all real numbers x
d. Domain of $f(x)$: all real numbers x except $x = -7$
   Domain of $g(x)$: all real numbers x
e. Domain of $f(x)$: all real numbers x except $x = 7$
   Domain of $g(x)$: all real numbers x

ANSWER: d
POINTS: 1
REFERENCES: 4.1.37a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 10:59 AM

68. Simplify f and find any vertical asymptotes of f.

$$f(x) = \frac{x^2 - 25}{x + 5}$$

a. $f(x) = x + 5$; Vertical asymptote: none
b. $f(x) = x - 5$; Vertical asymptote: $x = 5$
c. $f(x) = x - 5$; Vertical asymptote: none
d. $f(x) = x - 25$; Vertical asymptote: $x = 5$
e. $f(x) = x - 25$; Vertical asymptote: none

ANSWER: c
POINTS: 1

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Section 2.6 - Rational Functions

REFERENCES: 4.1.37b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:02 AM

69. Simplify $f(x)$ and find any vertical asymptotes.

$$f(x) = \frac{x^2 - 4}{x + 2}$$

a. $f(x) = x - 2$; no vertical asymptotes
b. $f(x) = -x - 2$; no vertical asymptotes
c. $f(x) = x$; no vertical asymptotes
d. $f(x) = x + 2$; no vertical asymptotes
e. $f(x) = -x + 2$; no vertical asymptotes

ANSWER: a
POINTS: 1
REFERENCES: 4.1.37b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:03 AM

70. Given $f(x) = \frac{x^2 - 9}{x + 3}$, $g(x) = x - 3$, complete the table and explain how the two functions differ.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$							
$g(x)$							

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	–7.5	Undefined	–6.5	–6	–5.5	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

a.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	–7.5	Undefined	–6.5	–6	–5.5	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

The graph of $f(x) = g(x)$ except when $x = -4$. Because the factor $x + 3$ canceled, there is a hole in the graph of $f(x)$ when $x = -4$.

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b.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	Undefined	–7	–6.5	–6	–5.5	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

The graph of $f(x) = g(x)$ except when $x = –4.5$. Because the factor $x + 3$ canceled, there is a hole in the graph of $f(x)$ when $x = –4.5$.

c.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	–7.5	–7	Undefined	–6	–5.5	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

The graph of $f(x) = g(x)$ except when $x = –3.5$. Because the factor $x + 3$ canceled, there is a hole in the graph of $f(x)$ when $x = –3.5$.

d.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	–7.5	–7	–6.5	Undefined	–5.5	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

The graph of $f(x) = g(x)$ except when $x = –3$. Because the factor $x + 3$ canceled, there is a hole in the graph of $f(x)$ when $x = –3$.

e.

x	–5	–4.5	–4	–3.5	–3	–2.5	–2
$f(x)$	–8	–7.5	–7	–6.5	–6	Undefined	–5
$g(x)$	–8	–7.5	–7	–6.5	–6	–5.5	–5

The graph of $f(x) = g(x)$ except when $x = –2.5$. Because the factor $x + 3$ canceled, there is a hole in the graph $f(x)$ when $x = –2.5$.

ANSWER: d
POINTS: 1
REFERENCES: 4.1.37d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:10 AM

71. Determine the domains of f and g.

$$f(x) = \frac{x^2(x+7)}{x^2+7x}, \; g(x) = x$$

a. Domain of f: all real numbers x except $x = 0$
Domain of g: all real numbers x

b. Domain of f: all real numbers x except $x = –7$
Domain of g: all real numbers x

c. Domain of f: all real numbers x except $x = 0, 7$
Domain of g: all real numbers x

d. Domain of f: all real numbers x except $x = –7$

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Domain of g: all real numbers x except $x = 0$

e. Domain of f: all real numbers x except $x = 0, -7$
Domain of g: all real numbers x

ANSWER: e
POINTS: 1
REFERENCES: 4.1.38a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:11 AM

72. Simplify f and find any vertical asymptotes of f.

$$f(x) = \frac{x^2(x+8)}{x^2+8x}$$

a. $f(x) = x + 8$; Vertical asymptote: $x = -8$
b. $f(x) = x$; Vertical asymptote: none
c. $f(x) = x$; Vertical asymptote: $x = -8$
d. $f(x) = x - 8$; Vertical asymptote: none
e. $f(x) = x^2$; Vertical asymptote: none

ANSWER: b
POINTS: 1
REFERENCES: 4.1.38b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:13 AM

73. Determine the domains of f and g.

$$f(x) = \frac{7x-1}{7x^2-x}, g(x) = \frac{1}{x}$$

a. Domain of f: all real numbers x except $x = 0, \frac{1}{7}$
Domain of g: all real numbers x except $x = 0$

b. Domain of f: all real numbers x except $x = -\frac{1}{7}$
Domain of g: all real numbers x except $x = 0$

c. Domain of f: all real numbers x except $x = 0$
Domain of g: all real numbers x

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d. Domain of f: all real numbers x except $x = 0, -\frac{1}{7}$
Domain of g: all real numbers x

e. Domain of f: all real numbers x
Domain of g: all real numbers x

ANSWER: a
POINTS: 1
REFERENCES: 4.1.39a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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74. Simplify f and find any vertical asymptotes of f.

$$f(x) = \frac{9x - 1}{9x^2 - x}$$

a. $f(x) = x^2$; Vertical asymptote: $x = 0$
b. $f(x) = x - 1$; Vertical asymptote: none
c. $f(x) = x$; Vertical asymptote: $x = 0$
d. $f(x) = x$; Vertical asymptote: none
e. $f(x) = \frac{1}{x}$; Vertical asymptote: $x = 0$

ANSWER: e
POINTS: 1
REFERENCES: 4.1.39b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:16 AM

75. Determine the domains of f and g.

$$f(x) = \frac{4x - 16}{x^2 - 9x + 20}, g(x) = \frac{4}{x - 4}$$

a. Domain of f: all real numbers x except $x = 4, 5$
Domain of g: all real numbers x except $x = -4$

b. Domain of f: all real numbers x
Domain of g: all real numbers x

c. Domain of f: all real numbers x except $x = 5$
Domain of g: all real numbers x

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d. Domain of f: all real numbers x except $x = 4, 5$
Domain of g: all real numbers x except $x = 4$

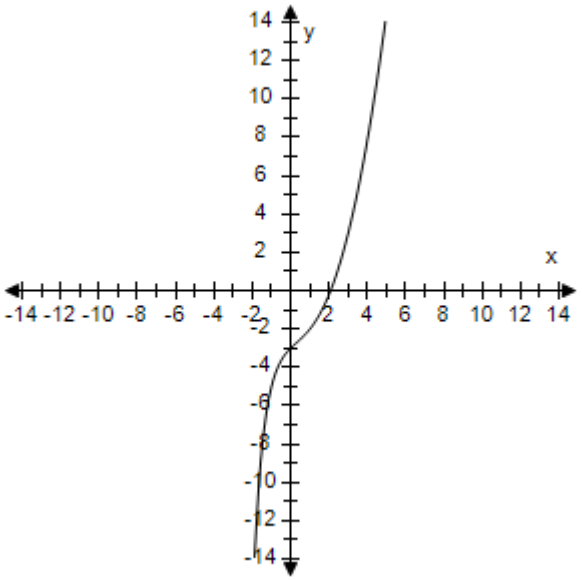
e. Domain of f: all real numbers x except $x = 4$
Domain of g: all real numbers x except $x = 4$

ANSWER: d
POINTS: 1
REFERENCES: 4.1.40a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 11:17 AM

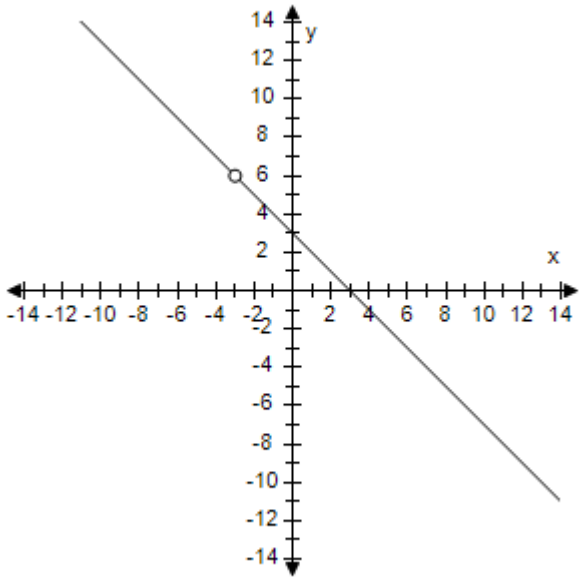
76. Select the correct graph of the following function.

$$f(x) = \frac{x^2 - 9}{x + 3}$$

a.



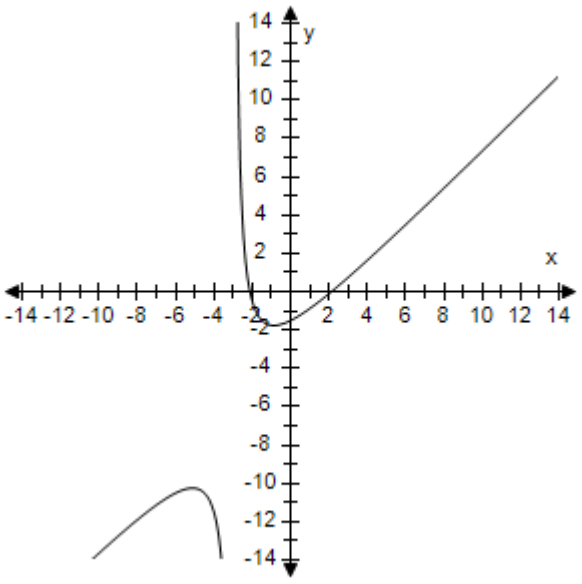
b.



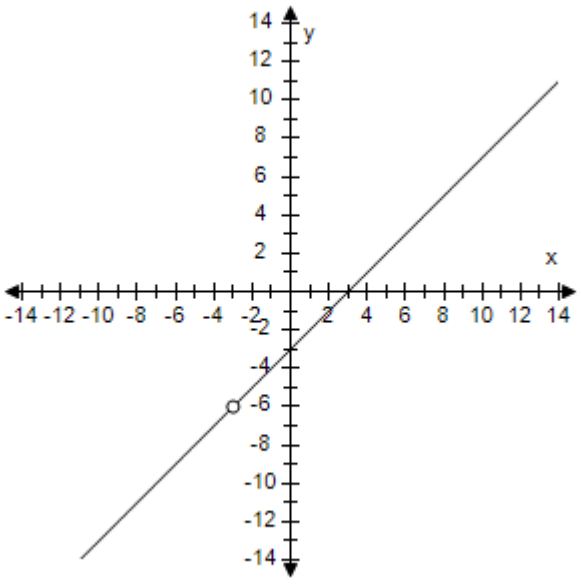
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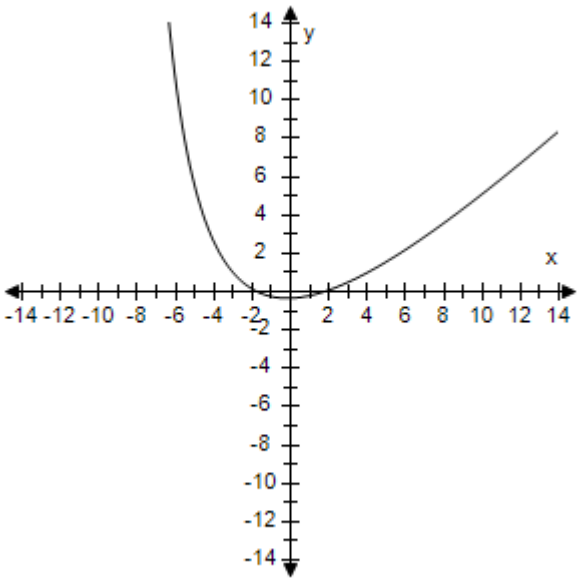
c.



d.



e.



ANSWER:	d
POINTS:	1
REFERENCES:	2.6.50d
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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Section 2.6 - Rational Functions

77. Given $f(x) = \dfrac{x^2 + 25}{x + 5}$, $g(x) = x - 5$, determine the domains of $f(x)$ and $g(x)$.

a. Domain of $f(x)$: all real numbers except $x = -5$
   Domain of $g(x)$: all real numbers except $x = 5$
b. Domain of $f(x)$: all real numbers
   Domain of $g(x)$: all real numbers except $x = 5$
c. Domain of $f(x)$: all real numbers
   Domain of $g(x)$: all real numbers
d. Domain of $f(x)$: all real numbers except $x = -5$
   Domain of $g(x)$: all real numbers
e. Domain of $f(x)$: all real numbers except $x = 5$
   Domain of $g(x)$: all real numbers

ANSWER: d
POINTS: 1
REFERENCES: 2.6.51a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 7:30 PM

78. Simplify $f(x)$ and find any vertical asymptotes.

$$f(x) = \frac{x^2 - 9}{x + 3}$$

a. $f(x) = -x + 3$; no vertical asymptotes
b. $f(x) = x$; no vertical asymptotes
c. $f(x) = -x - 3$; no vertical asymptotes
d. $f(x) = x - 3$; no vertical asymptotes
e. $f(x) = x + 3$; no vertical asymptotes

ANSWER: d
POINTS: 1
REFERENCES: 2.6.51b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 7:31 PM

79. Given $f(x) = \dfrac{x^2 - 36}{x + 6}$, $g(x) = x - 6$, complete the table and explain how the two functions differ.

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x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$							
$g(x)$							

a.

x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$	–14	–13.5	–13	–12.5	Undefined	–11.5	–11
$g(x)$	–14	–13.5	–13	–12.5	–12	–11.5	–11

The graph of $f(x) = g(x)$ except when $x = –6$. Because the factor $x + 6$ canceled, there is a hole in the graph of $f(x)$ when $x = –6$.

b.

x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$	–14	–13.5	–13	–12.5	–12	Undefined	–11
$g(x)$	–14	–13.5	–13	–12.5	–12	–11.5	–11

The graph of $f(x) = g(x)$ except when $x = –5.5$. Because the factor $x + 6$ canceled, there is a hole in the graph of $f(x)$ when $x = –5.5$.

c.

x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$	–14	–13.5	–13	Undefined	–12	–11.5	–11
$g(x)$	–14	–13.5	–13	–12.5	–12	–11.5	–11

The graph of $f(x) = g(x)$ except when $x = –6.5$. Because the factor $x + 6$ canceled, there is a hole in the graph of $f(x)$ when $x = –6.5$.

d.

x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$	–14	–13.5	Undefined	–12.5	–12	–11.5	–11
$g(x)$	–14	–13.5	–13	–12.5	–12	–11.5	–11

The graph of $f(x) = g(x)$ except when $x = –7$. Because the factor $x + 6$ canceled, there is a hole in the graph of $f(x)$ when $x = –7$.

e.

x	–8	–7.5	–7	–6.5	–6	–5.5	–5
$f(x)$	–14	Undefined	–13	–12.5	–12	–11.5	–11
$g(x)$	–14	–13.5	–13	–12.5	–12	–11.5	–11

The graph of $f(x) = g(x)$ except when $x = –7.5$. Because the factor $x + 6$ canceled, there is a hole in the graph of $f(x)$ when $x = –7.5$.

ANSWER: a
POINTS: 1
REFERENCES: 2.6.51d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 7:40 PM

80. Given $f(x) = \dfrac{7x + 4}{7x^2 + 4x}$, $g(x) = \dfrac{1}{x}$, determine the domains of $f(x)$ and $g(x)$.

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a. Domain of $f(x)$: all real numbers except $x = 7$ and $x = \frac{4}{7}$

Domain of $g(x)$: all real numbers except $x = 0$

b. Domain of $f(x)$: all real numbers except $x = -\frac{4}{7}$

Domain of $g(x)$: all real numbers except $x = 1$

c. Domain of $f(x)$: all real numbers
Domain of $g(x)$: all real numbers

d. Domain of $f(x)$: all real numbers except $x = -\frac{7}{4}$

Domain of $g(x)$: all real numbers except $x = 0$

e. Domain of $f(x)$: all real numbers except $x = 0$ and $x = -\frac{4}{7}$

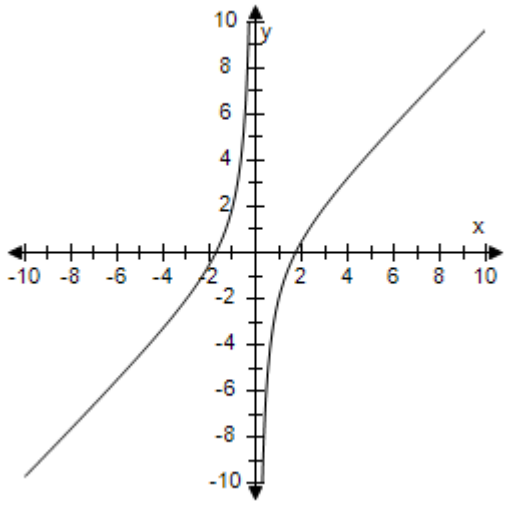
Domain of $g(x)$: all real numbers except $x = 0$

ANSWER: e
POINTS: 1
REFERENCES: 2.6.53a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 7:48 PM

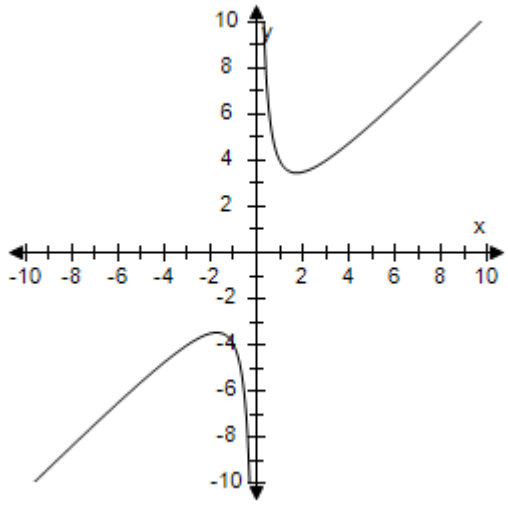
81. Select the correct graph of the following function.

$$f(x) = \frac{x^2 - 9}{x}$$

a.



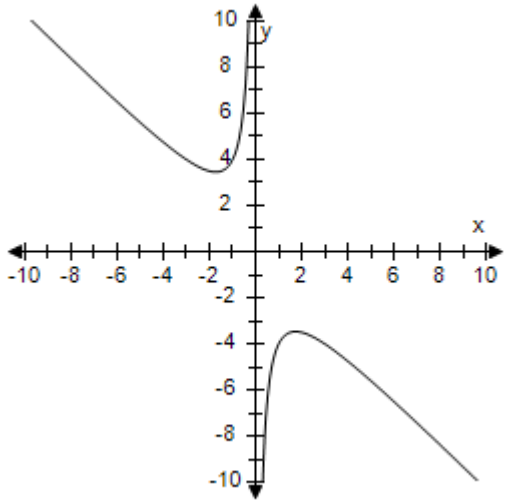
b.



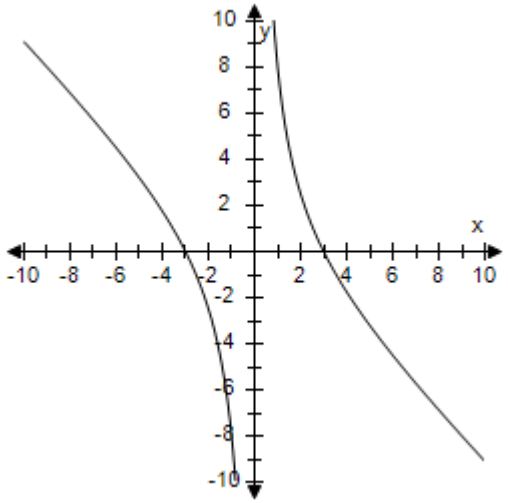
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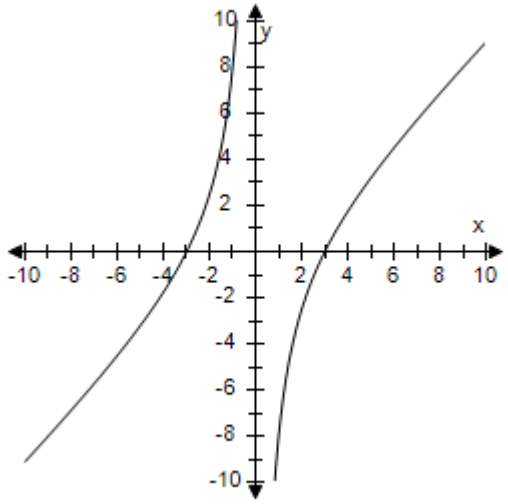
c.



d.



e.



ANSWER: e
POINTS: 1
REFERENCES: 2.6.55d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 11/13/2014 5:11 AM

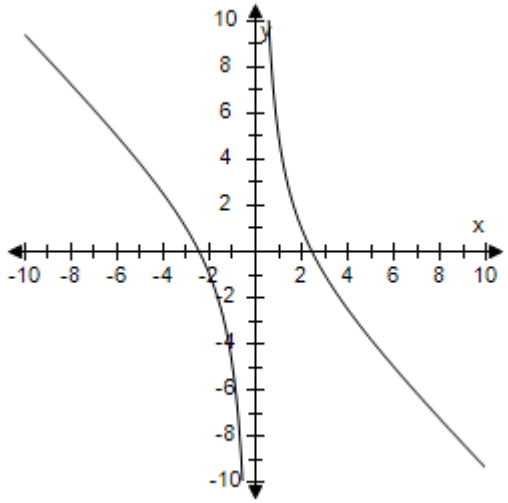
82. Select the correct graph of the following function.

$$f(x) = \frac{x^2 + 6}{x}$$

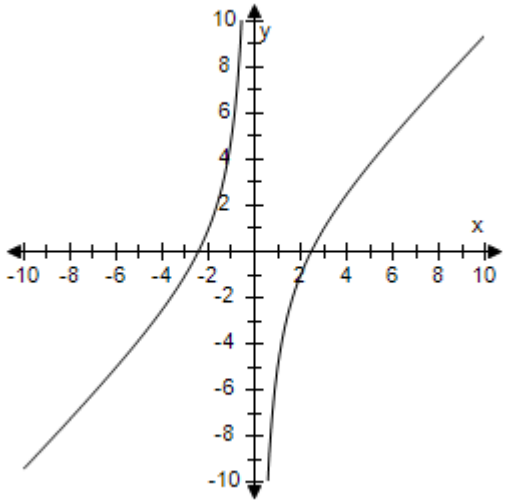
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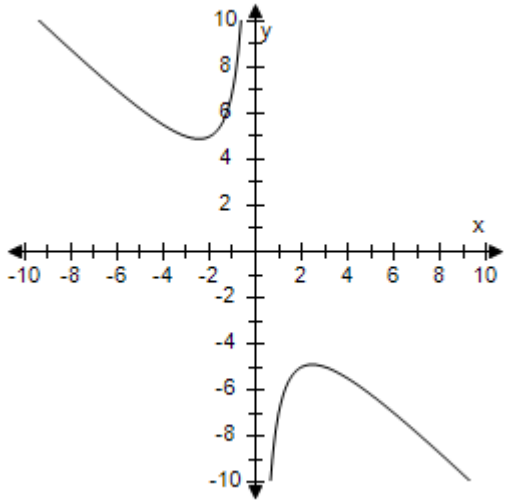
a.



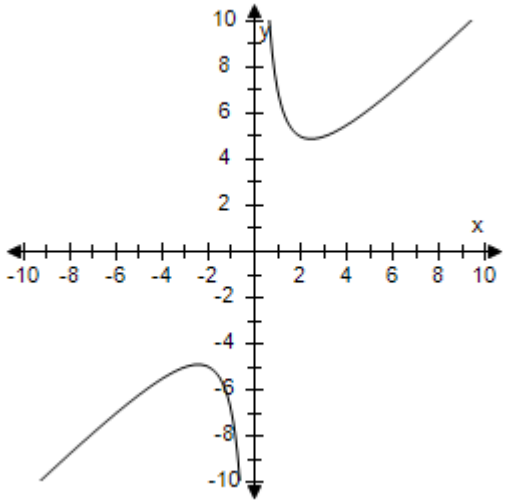
b.



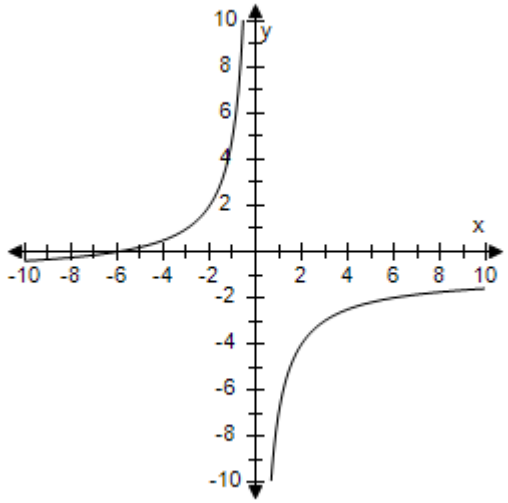
c.



d.



e.



ANSWER: d

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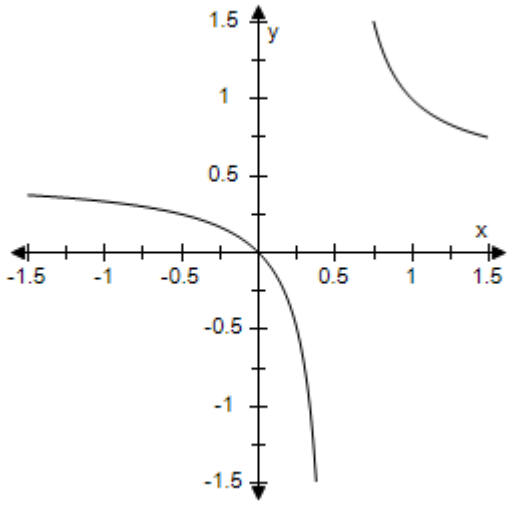
Section 2.6 - Rational Functions

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REFERENCES: 2.6.56d
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 5/14/2015 11:40 AM

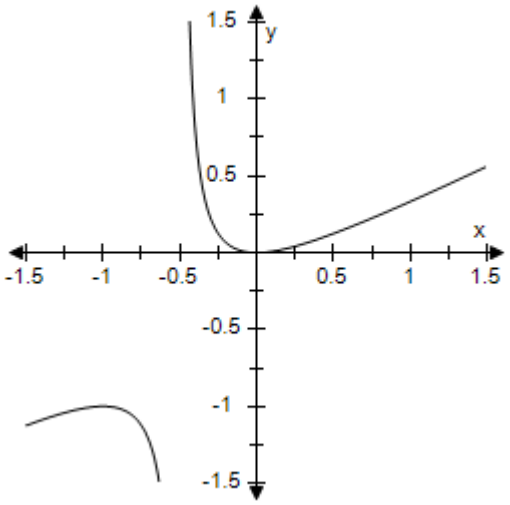
83. Select the correct graph of the following function.

$$f(x) = \frac{x^2}{2x+1}$$

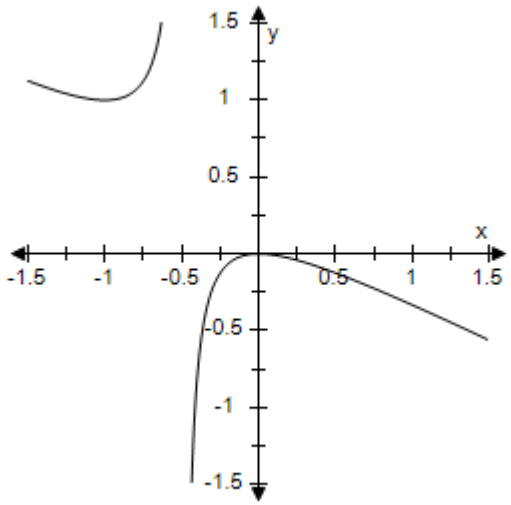
a.



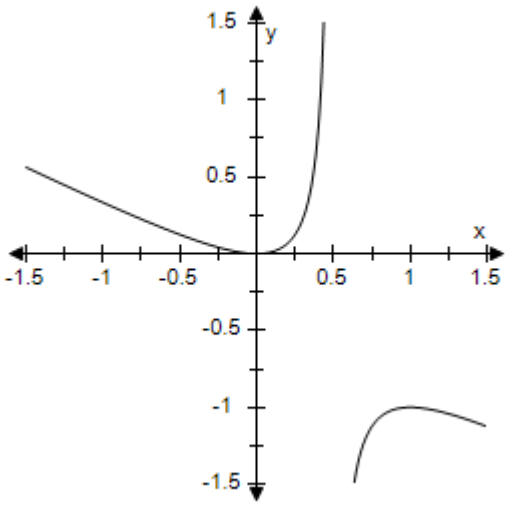
b.



c.

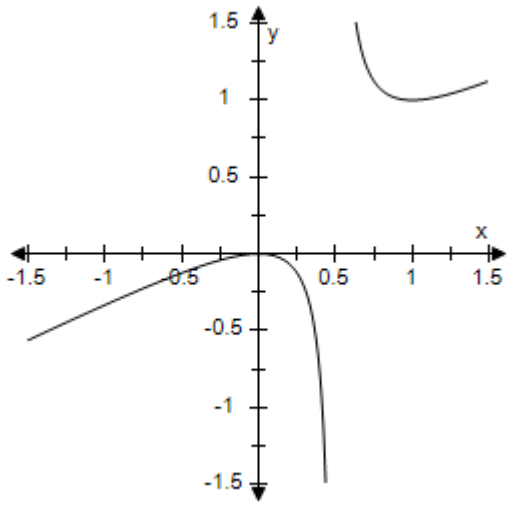


d.



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e.



ANSWER: b
POINTS: 1
REFERENCES: 2.6.62d
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 7:58 PM

84. Given $f(x) = \dfrac{x^2 + 8x + 2}{x + 6}$, determine the equations of any slant and vertical asymptotes.

a. slant: $y = x - 2$; vertical: $x = 2$
b. slant: $y = x + 2$; vertical: $x = -6$
c. slant: none; vertical: none
d. slant: $y = x + 14$; vertical: none
e. slant: $y = x - 4$; vertical: $x = 8$

ANSWER: b
POINTS: 1
REFERENCES: 2.6.65c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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85. Find all intercepts of the following function.

$$f(x) = \frac{4x^2 - 6x + 6}{x - 4}$$

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a. y-intercept: $\left(0, -\frac{3}{2}\right)$

b. y-intercept: $\left(\frac{3}{2}, 0\right)$

c. y-intercept: (0, 3)

d. intercept: (0, 0)

e. x-intercept: $\left(-\frac{3}{2}, 0\right)$

ANSWER: a
POINTS: 1
REFERENCES: 2.6.66b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 8:07 PM

86. Given $f(x) = \frac{x^2 - 10x + 21}{x + 4}$, determine the equations of any slant and vertical asymptotes.

a. slant: $y = x + 8$; vertical: $x = -11$
b. slant: $y = x - 14$; vertical: none
c. slant: $y = x + 7$; vertical: $x = -4$
d. slant: $y = x - 14$; vertical: $x = -4$
e. slant: $y = x + 7$; vertical: $x = -7$

ANSWER: d
POINTS: 1
REFERENCES: 2.6.66c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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87. The cost C (in millions of dollars) of removing p% of the industrial and municipal pollutants discharged into a river is given by

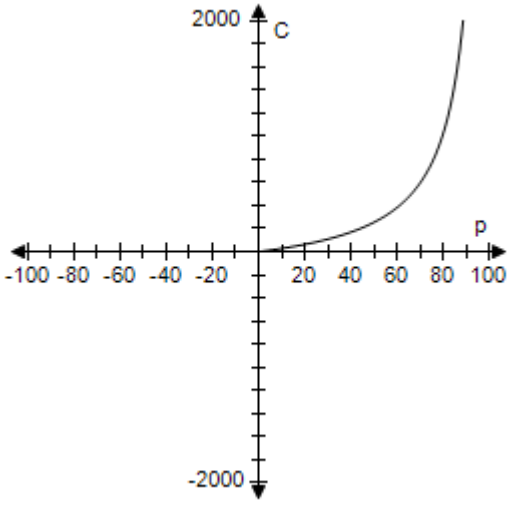
$$C = \frac{255p}{100 - p}, \ 0 \le p < 100.$$

Select the correct graph of the cost function.

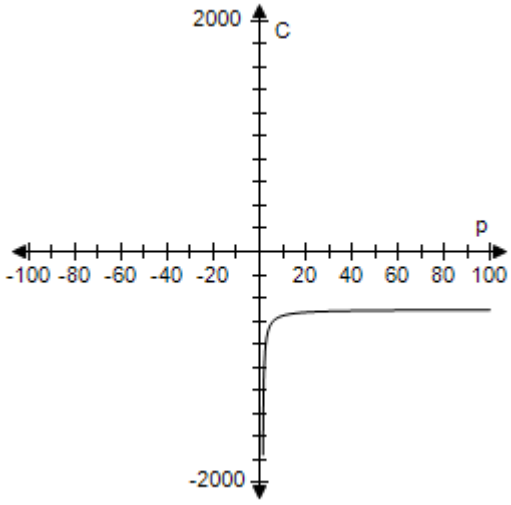
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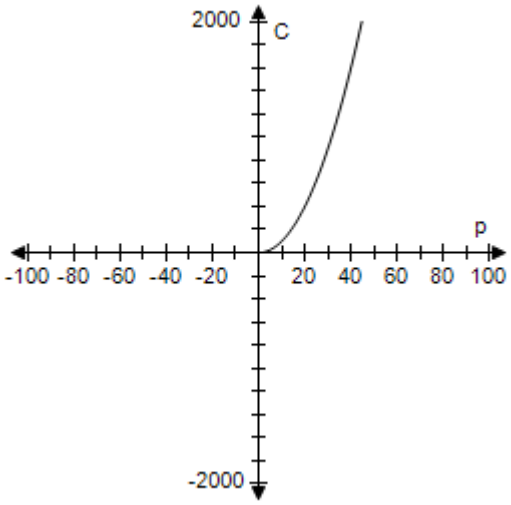
a.



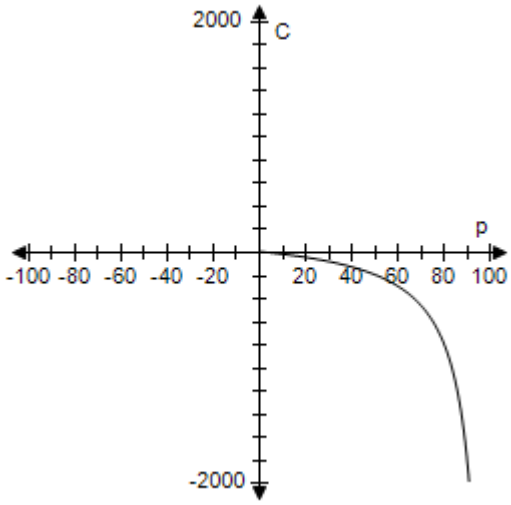
b.



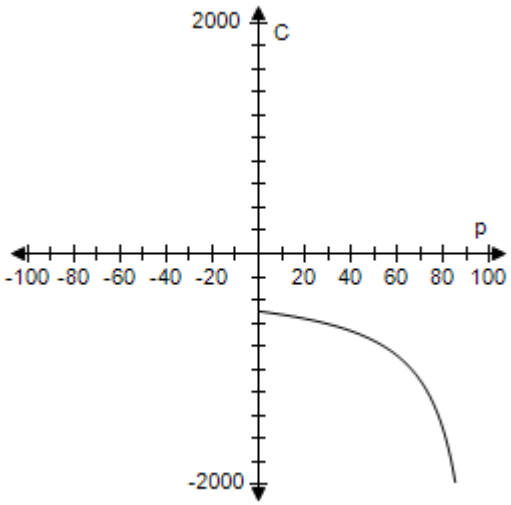
c.



d.



e.



ANSWER: a

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POINTS: 1
REFERENCES: 4.1.41a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 8:14 PM

88. The cost C (in millions of dollars) of removing p% of the industrial and municipal pollutants discharged into a river is given by

$$C = \frac{245p}{100 - p}, \ 0 \le p < 100.$$

Find the costs of removing 45% of the pollutants.
(Round your answer to two decimal places.)

a. $220.45 million
b. $240.45 million
c. $230.45 million
d. $210.45 million
e. $200.45 million

ANSWER: e
POINTS: 1
REFERENCES: 4.1.41b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
DATE MODIFIED: 6/1/2021 8:17 PM

89. The cost C (in millions of dollars) of removing p% of the industrial and municipal pollutants discharged into a river is given by

$$C = \frac{235p}{100 - p}, \ 0 \le p < 100.$$

According to this model, would it be possible to remove 100% of the pollutants? Explain.

a. No. The function is undefined at $p = 100$.
b. Yes

ANSWER: a
POINTS: 1
REFERENCES: 4.1.41c
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True

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Section 2.6 - Rational Functions

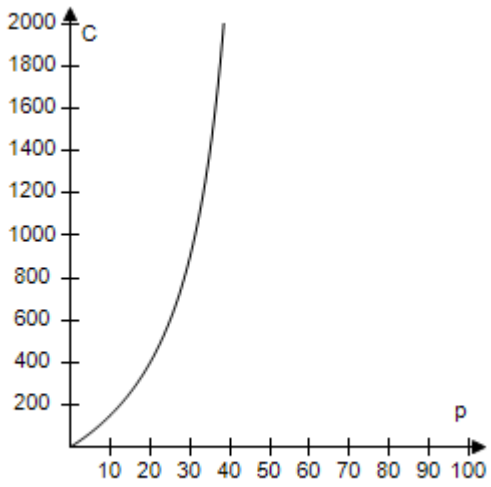
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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90. The cost C (in millions of dollars) of removing p% of the industrial and municipal pollutants discharged into a river is given by

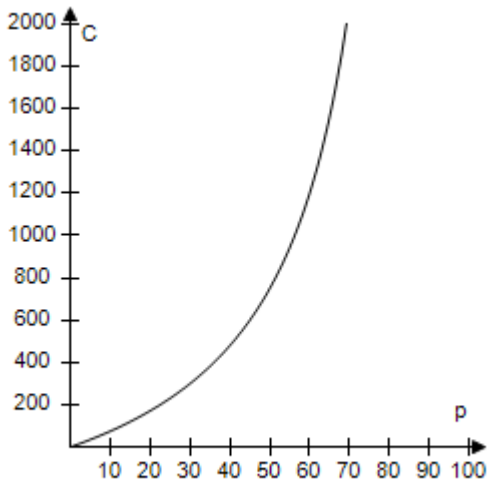
$$C = \frac{200p}{100 - p}, \ 0 \le p < 100.$$

Select the correct graph of the cost function.

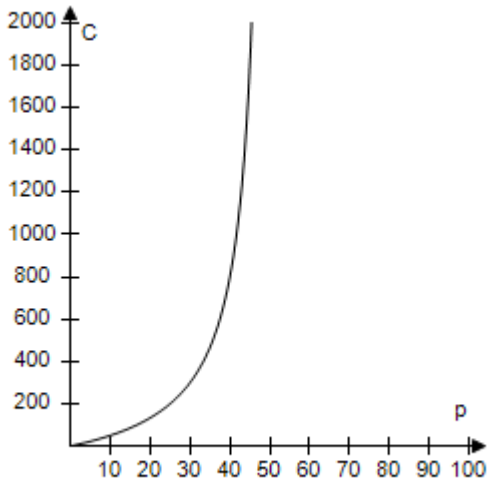
a.



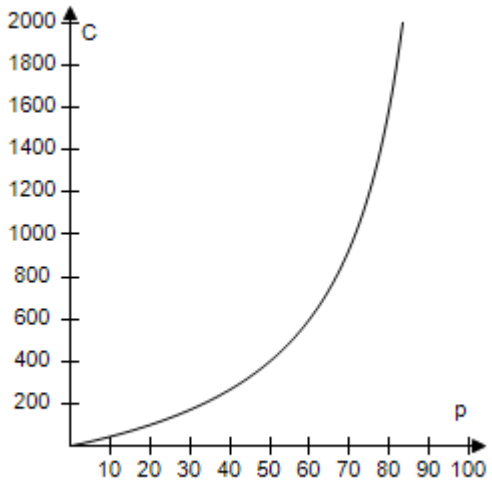
b.



c.

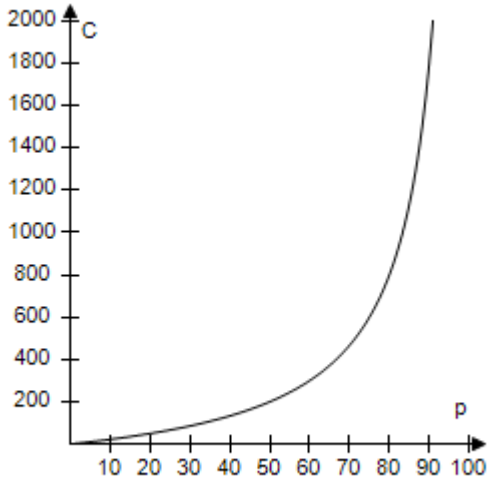


d.



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e.



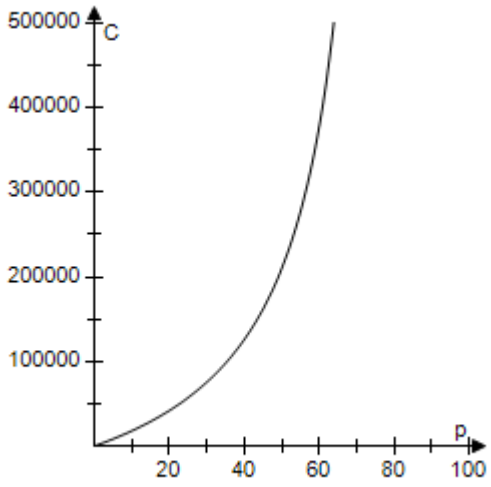
ANSWER: e
POINTS: 1
REFERENCES: 2.6.77a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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91. In a pilot project, a rural township is given recycling bins for separating and storing recyclable products. The cost C (in dollars) of supplying bins to p% of the population is given by

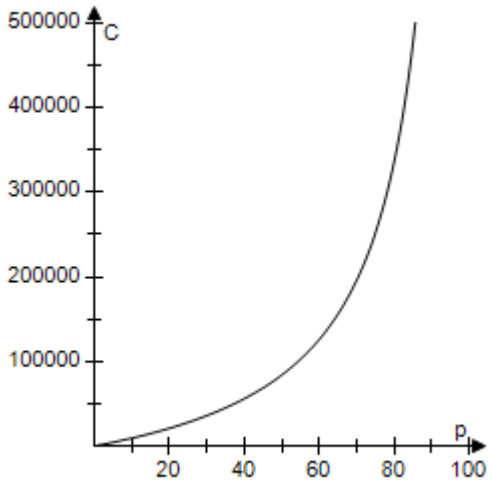
$$C = \frac{42{,}000p}{100-p}, \ 0 \le p < 100.$$

Select the correct graph of the cost function.

a.

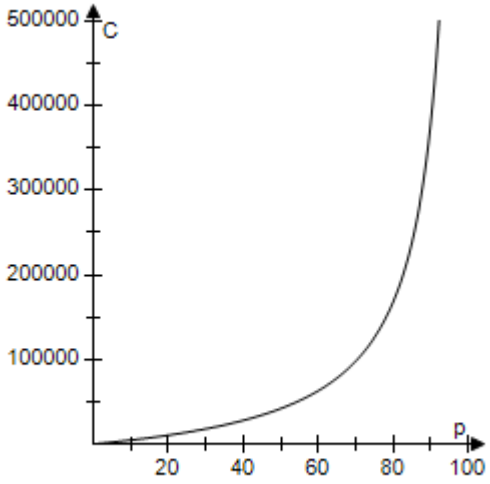


b.

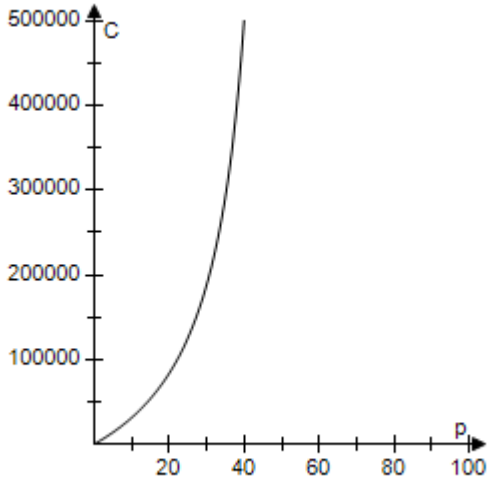


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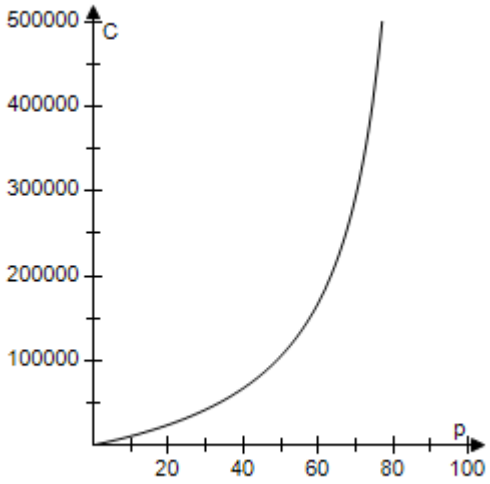
c.



d.



e.



ANSWER: c
POINTS: 1
REFERENCES: 2.6.78a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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92. The game commission introduces 100 deer into newly acquired state game lands. The population N of the herd is modeled by

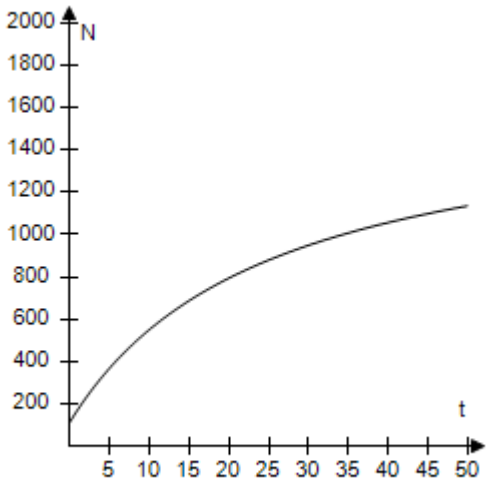
$$N = \frac{22(5+3t)}{1+0.04t}, \; t \geq 0$$

where t is the time in years.

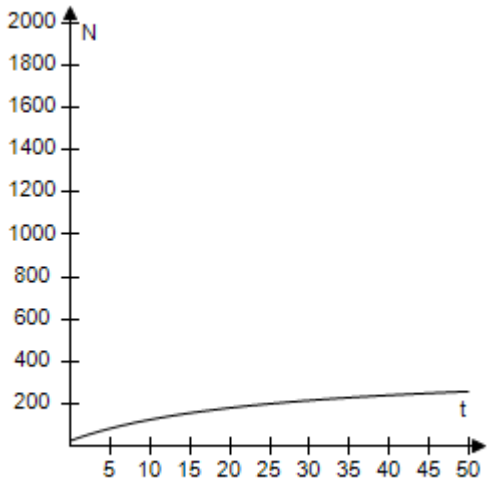
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Select the correct graph of this model.

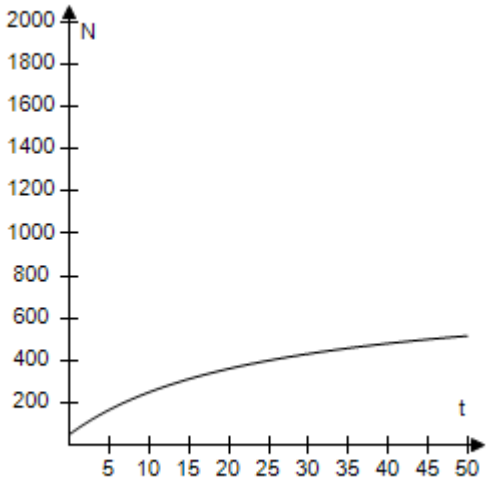
a.



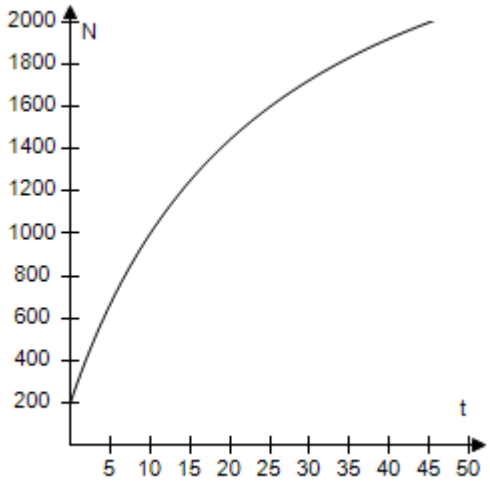
b.



c.

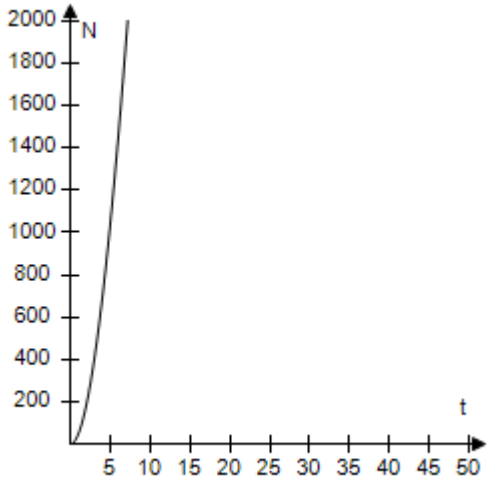


d.



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e.



ANSWER: a
POINTS: 1
REFERENCES: 4.1.44a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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93. The game commission introduces 100 deer into newly acquired state game lands. The population N of the herd is modeled by

$$N = \frac{24(5+3t)}{1+0.04t}, \; t \geq 0$$

where t is the time in years. Find the population when $t = 40$.
(Round your answer to the nearest whole number.)

a. 1,154 deer
b. 1,306 deer
c. 1,275 deer
d. 1,240 deer
e. 1,200 deer

ANSWER: a
POINTS: 1
REFERENCES: 4.1.44b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM

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Section 2.6 - Rational Functions

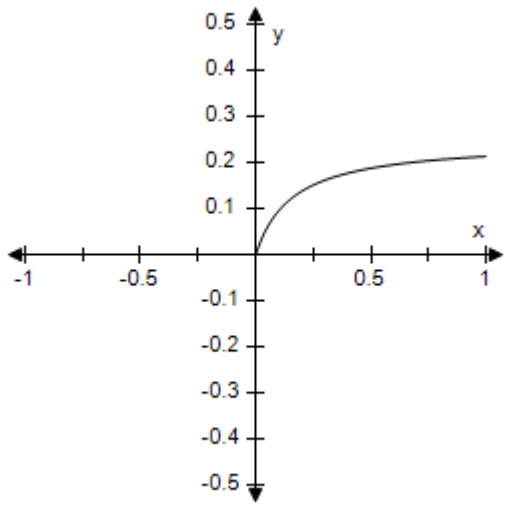
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94. A biology class performs an experiment comparing the quantity of food consumed by a certain kind of moth with the quantity supplied. The model for the experimental data is given by

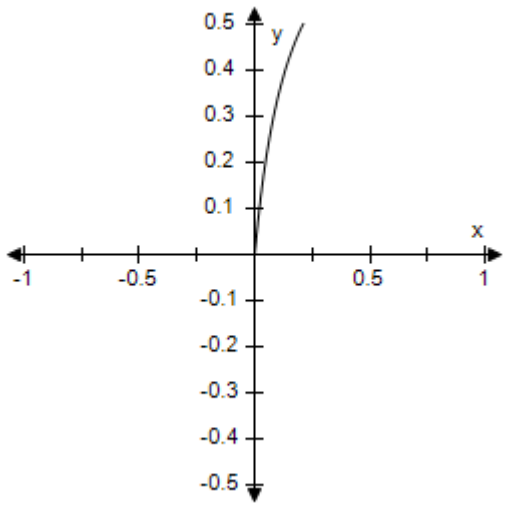
$$y = \frac{1.571x - 0.001}{6.360x + 1}, x > 0$$

where x is the quantity (in milligrams) of food supplied and y is the quantity (in milligrams) of food consumed. Select the correct graph of this model.

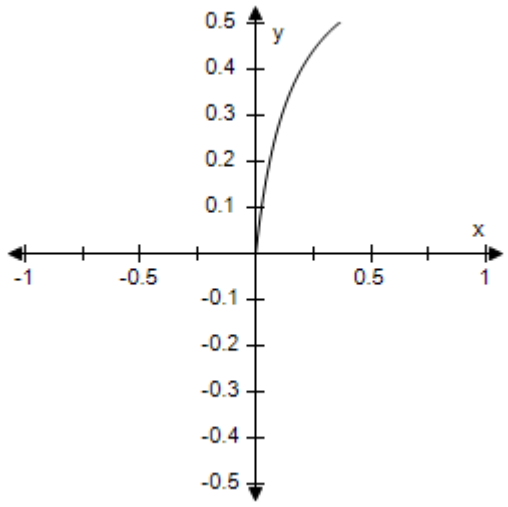
a.



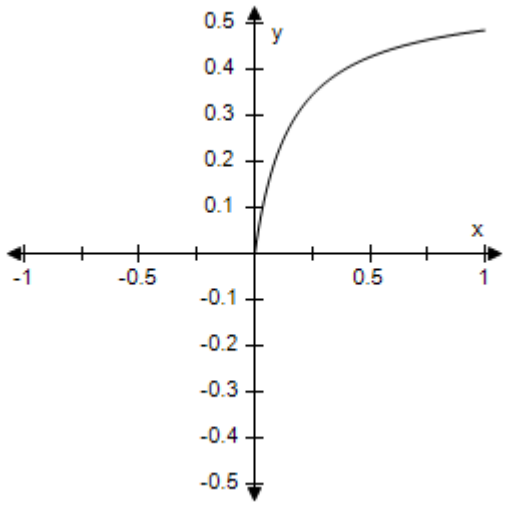
b.



c.

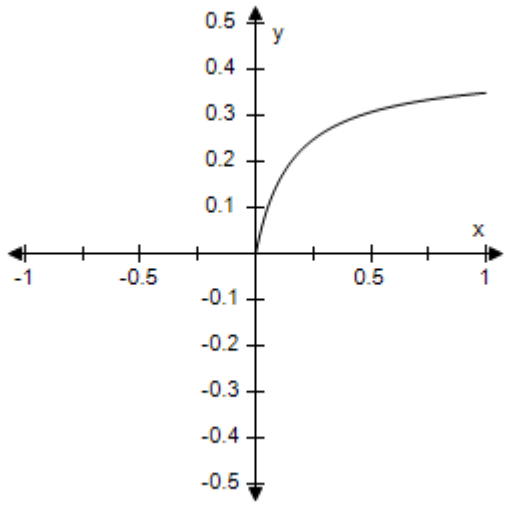


d.



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e.



ANSWER: a
POINTS: 1
REFERENCES: 4.1.45a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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95. A biology class performs an experiment comparing the quantity of food consumed by a certain kind of moth with the quantity supplied. The model for the experimental data is given by

$$y = \frac{1.572x - 0.001}{6.367x + 1}, x > 0$$

where x is the quantity (in milligrams) of food supplied and y is the quantity (in milligrams) of food consumed. At what level of consumption will the moth become satiated?

a. About 0.297 mg
b. About 0.347 mg
c. About 0.397 mg
d. About 0.247 mg
e. About 0.447 mg

ANSWER: d
POINTS: 1
REFERENCES: 4.1.45b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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96. Determine the value that the function f approaches as the magnitude of x increases.

$$f(x) = 3 - \frac{4}{x}$$

a. 2
b. –4
c. 3
d. –3
e. –2.75

ANSWER: c
POINTS: 1
REFERENCES: 4.1.49
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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97. Determine the value that the function f approaches as the magnitude of x increases.

$$f(x) = 3 + \frac{1}{x-4}$$

a. 2.75
b. 3
c. 1
d. 4
e. –0.25

ANSWER: b
POINTS: 1
REFERENCES: 4.1.50
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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98. Determine the value that the function f approaches as the magnitude of x increases.

$$f(x) = \frac{3x-1}{x-4}$$

a. ∞
b. –4

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c. 3
d. –1
e. 0

ANSWER: c
POINTS: 1
REFERENCES: 4.1.51
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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99. Determine the value that the function f approaches as the magnitude of x increases.

$$f(x) = \frac{8x - 1}{x^2 + 2}$$

a. 0
b. $-\frac{1}{2}$
c. –1
d. 8
e. $-\frac{1}{5}$

ANSWER: a
POINTS: 1
REFERENCES: 4.1.52
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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100. Determine the domain of the function $f(x) = \frac{x^2 - 16}{x^2 + 5x + 4}$.

a. Domain: all real numbers except $x = -4$ and $x = 1$
b. Domain: all real numbers except $x = 1$
c. Domain: all real numbers except $x = -4$ and $x = -1$
d. Domain: all real numbers except $x = 4$ and $x = 1$
e. Domain: all real numbers

ANSWER: c
POINTS: 1

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Section 2.6 - Rational Functions

REFERENCES: 161
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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101. Determine the zeros (if any) of the rational function $f(x) = \dfrac{x^2 - 81}{x + 2}$.

a. $x = -2$
b. $x = -\dfrac{9}{2}, x = \dfrac{9}{2}$
c. $x = -81, x = 81$
d. $x = -9, x = 9$
e. no zeros

ANSWER: d
POINTS: 1
REFERENCES: 164
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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102. Determine the zeros (if any) of the rational function $g(x) = \dfrac{x^3 - 8}{x^2 + 6}$.

a. $x = -2, x = 2$
b. $x = 2$
c. $x = -\sqrt{6}, x = \sqrt{6}, x = 2$
d. $x = -\sqrt{6}, x = \sqrt{6}, x = -2, x = 2$
e. no zeros

ANSWER: b
POINTS: 1
REFERENCES: 166
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.6 - Rational Functions

103. Determine the zeros (if any) of the rational function $g(x) = 5 + \frac{4}{x^2 + 5}$.

a. $x = -\sqrt{5}, x = \sqrt{5}$

b. $x = -4$

c. $x = -\frac{4}{5}, x = \frac{4}{5}$

d. $x = -5, x = 5$

e. no zeros

ANSWER: e
POINTS: 1
REFERENCES: 165
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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104. Given $f(x) = \frac{5x + 4}{5x^2 + 4x}$, $g(x) = \frac{1}{x}$:

a. Determine the domains of $f(x)$ and $g(x)$.
b. Simplify $f(x)$ and find any vertical asymptotes.
c. Complete the table.

x	-1	$-\frac{4}{5}$	0	$\frac{4}{5}$	1	2	3
$f(x)$							
$g(x)$							

d. Explain how the two functions differ.

ANSWER:

a. Domain of $f(x)$: all real numbers except $x = 0$ and $x = -\frac{4}{5}$

Domain of $g(x)$: all real numbers except $x = 0$

b. $f(x) = \frac{1}{x}$; vertical asymptote $x = 0$

c.

x	-1	$-\frac{4}{5}$	0	$\frac{4}{5}$	1	2	3
$f(x)$	-1	undefined	undefined	$\frac{5}{4}$	1	$\frac{1}{2}$	$\frac{1}{3}$

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$g(x)$	–1	$-\frac{5}{4}$	undefined	$\frac{5}{4}$	1	$\frac{1}{2}$	$\frac{1}{3}$

d. The graph of $f(x) = g(x)$ except when $x = -\frac{4}{5}$. Because the factor $5x + 4$ canceled, there is a hole in the graph of $f(x)$ when $x = -\frac{4}{5}$.

POINTS: 1
REFERENCES: 168
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:20 PM
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105. Given $f(x) = \frac{5x - 15}{x^2 - 7x + 12}$, $g(x) = \frac{5}{x - 4}$:

a. Determine the domains of $f(x)$ and $g(x)$.
b. Simplify $f(x)$ and find any vertical asymptotes.
c. Complete the table.

x	0	1	2	3	4	5	6
$f(x)$							
$g(x)$							

d. Explain how the two functions differ.

ANSWER:

a. Domain of $f(x)$: all real numbers except $x = 3$ and $x = 4$
Domain of $g(x)$: all real numbers except $x = 4$

b. $f(x) = \frac{5}{x - 4}$; vertical asymptote $x = 4$

c.

x	0	1	2	3	4	5	6
$f(x)$	$-\frac{5}{4}$	$-\frac{5}{3}$	$-\frac{5}{2}$	undefined	undefined	5	$\frac{5}{2}$
$g(x)$	$-\frac{5}{4}$	$-\frac{5}{3}$	$-\frac{5}{2}$	–5	undefined	5	$\frac{5}{2}$

d. The graph of $f(x) = g(x)$ except when $x = 3$. Because the factor $x - 3$ canceled, there is a hole in the graph of $f(x)$ when $x = 3$.

POINTS: 1
REFERENCES: 169
QUESTION TYPE: Subjective Short Answer
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.6 - Rational Functions

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Section 2.7 - Nonlinear Inequalities

1. Determine whether the value of $x = \frac{2}{7}$ is a solution of the inequality.

$x^2 - 2 < 0$

a. Yes
b. No

ANSWER: a
POINTS: 1
REFERENCES: 1.8.5
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 5/16/2015 3:00 AM

2. Determine whether the value of $x = -6$ is a solution of the inequality.

$x^2 - x - 14 \geq 0$

a. No
b. Yes

ANSWER: b
POINTS: 1
REFERENCES: 1.8.6
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 5/16/2015 3:01 AM

3. Determine whether the value of $x = -1$ is a solution of the inequality.

$$\frac{3x^2}{x^2+4} < 1$$

a. Yes
b. No

ANSWER: a
POINTS: 1
REFERENCES: 1.8.8
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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Section 2.7 - Nonlinear Inequalities

4. Find the key numbers of the expression.

$16x^3 - 49x^2$

a. $0, \frac{16}{49}$
b. 0, 49
c. 0, 51
d. 0, –49
e. $0, \frac{49}{16}$

ANSWER: e
POINTS: 1
REFERENCES: 1.8.10
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 9/24/2014 4:17 AM

5. Find the key numbers of the expression.

$\frac{1}{x-7} + 1$

a. –6, 7
b. 6, 7, 1
c. –6, –7
d. 6, 7
e. 6, –7

ANSWER: d
POINTS: 1
REFERENCES: 1.8.11
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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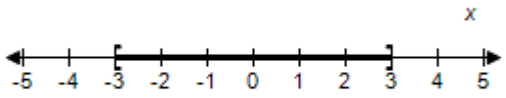
6. Solve the inequality and graph the solution on the real number line.

$x^2 < 9$

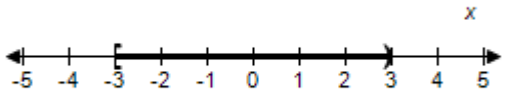
a. $[-3, 3]$

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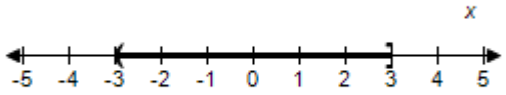
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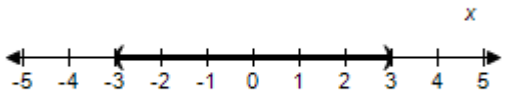
b. $[-3, 3)$



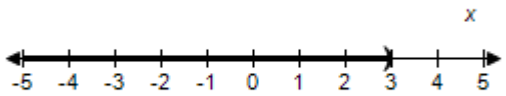
c. $(-3, 3]$



d. $(-3, 3)$



e. $(-\infty, 3)$



ANSWER: d
POINTS: 1
REFERENCES: 1.8.13
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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7. Solve the inequality and graph the solution on the real number line.

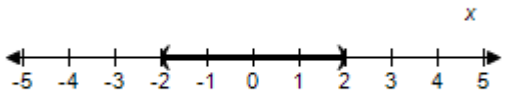
$x^2 \leq 4$

a. $(-2, 2)$

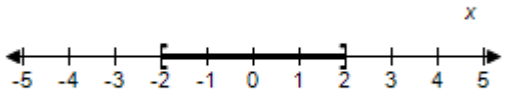
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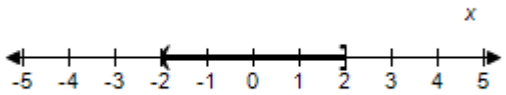
Section 2.7 - Nonlinear Inequalities



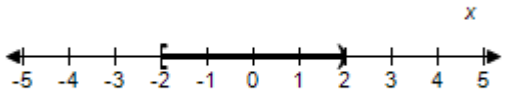
b. $[-2, 2]$



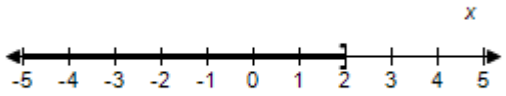
c. $(-2,2]$



d. $[-2,2)$



e. $(-\infty,2]$



ANSWER: b
POINTS: 1
REFERENCES: 1.8.14
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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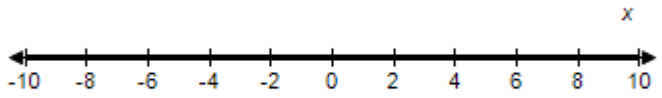
8. Solve the inequality and graph the solution on the real number line.

$(x-7)^2 \geq 1$

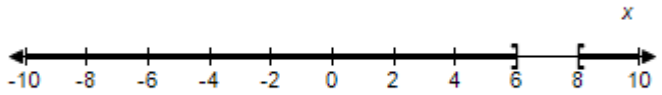
a. $(-\infty, \infty)$

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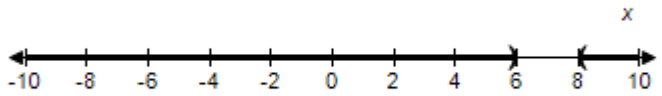
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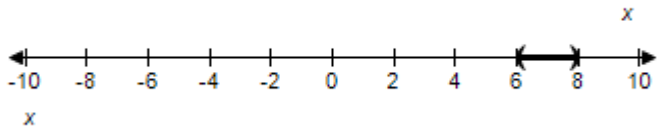
b. $(-\infty, 6] \cup [8, \infty)$



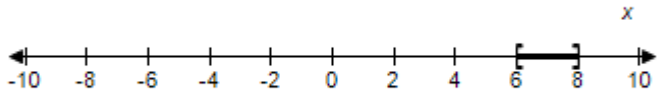
c. $(-\infty, 6) \cup (8, \infty)$



d. $(6,8)$



e. $[6,8]$



ANSWER: b
POINTS: 1
REFERENCES: 1.8.16
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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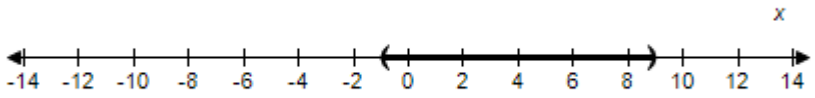
9. Solve the inequality and graph the solution on the real number line.

$x^2 - 8x + 10 < 19$

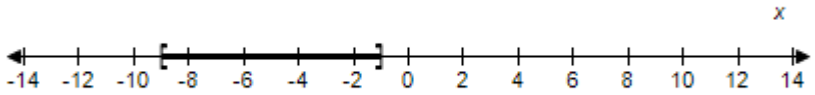
a. $(-1, 9)$

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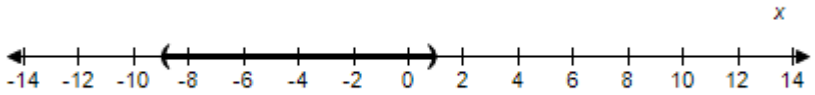
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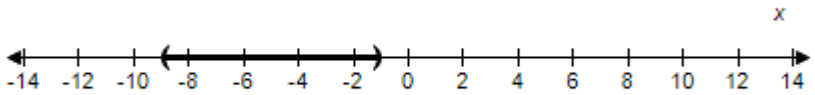
b. $[-9, -1]$



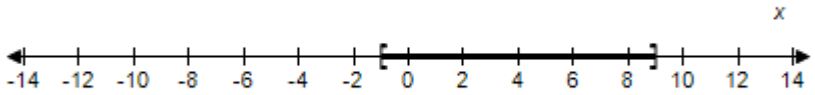
c. $(-9, 1)$



d. $(-9, -1)$



e. $[-1, 9]$



ANSWER: a
POINTS: 1
REFERENCES: 1.8.18
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 1:34 AM

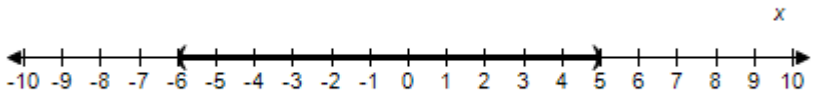
10. Solve the inequality and graph the solution on the real number line.

$x^2 + x < 30$

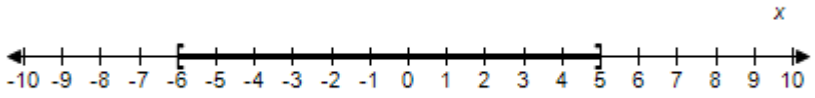
a. $(-6, 5)$

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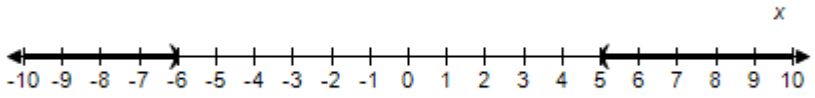
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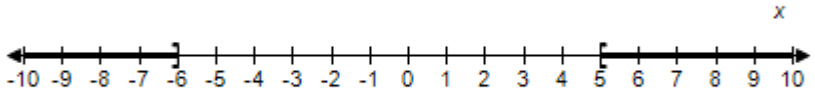
b. $[-6,5]$



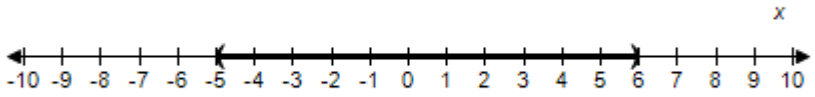
c. $(-\infty,-6)\cup(5,\infty)$



d. $(-\infty,-6]\cup[5,\infty)$



e. $(-5,6)$



ANSWER: a
POINTS: 1
REFERENCES: 1.8.19
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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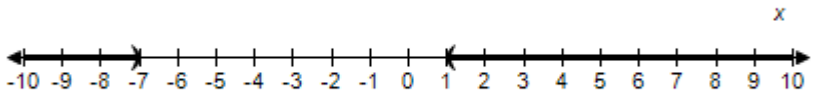
11. Solve the inequality and graph the solution on the real number line.

$x^2+6x>7$

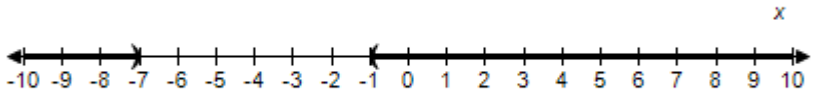
a. $(-\infty,-7)\cup(1,\infty)$

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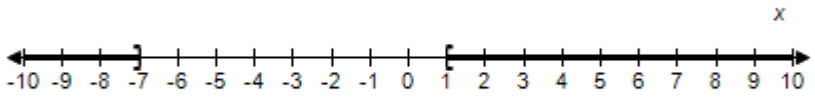
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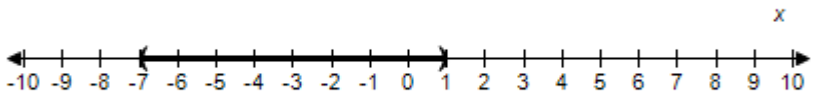
b. $(-\infty, -7) \cup (-1, \infty)$



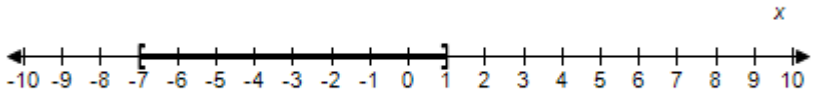
c. $(-\infty, -7] \cup [1, \infty)$



d. $(-7, 1)$



e. $[-7, 1]$



ANSWER:	a
POINTS:	1
REFERENCES:	1.8.20
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:17 PM
DATE MODIFIED:	6/16/2021 2:17 AM

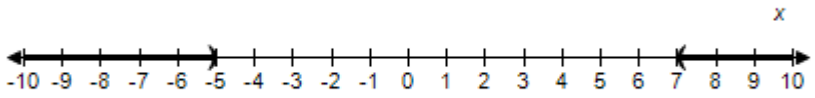
12. Solve the inequality and graph the solution on the real number line.

$x^2 > 2x + 35$

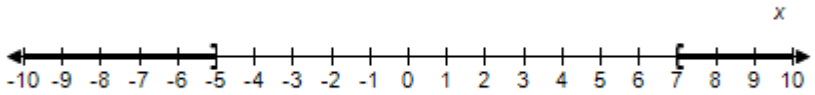
a. $(-\infty, -5) \cup (7, \infty)$

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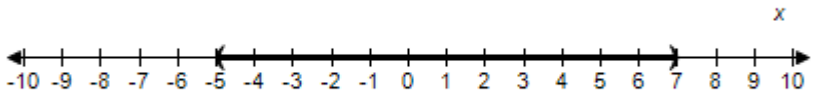
Section 2.7 - Nonlinear Inequalities



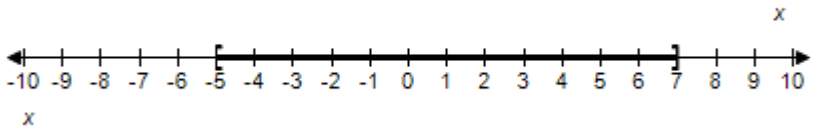
b. $(-\infty, -5] \cup [7, \infty)$



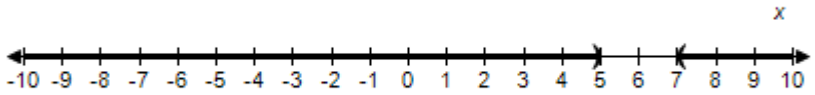
c. $(-5, 7)$



d. $[-5, 7]$



e. $(-\infty, 5) \cup (7, \infty)$



ANSWER:	a
POINTS:	1
REFERENCES:	1.8.22
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:17 PM
DATE MODIFIED:	6/16/2021 2:33 AM

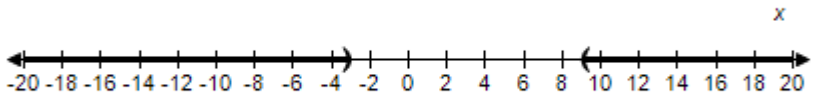
13. Solve the inequality and graph the solution on the real number line.

$x^2 - 6x - 27 > 0$

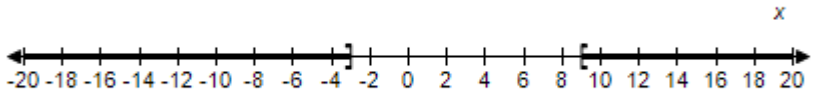
a. $(-\infty, -3) \cup (9, \infty)$

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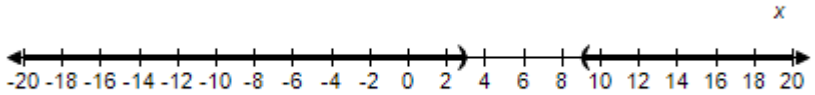
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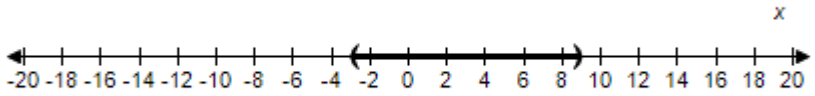
b. $(-\infty, -3] \cup [9, \infty)$



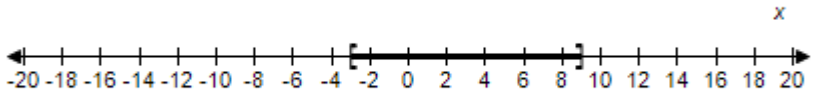
c. $(-\infty, 3) \cup (9, \infty)$



d. $(-3,9)$



e. $[-3,9]$



ANSWER:	a
POINTS:	1
REFERENCES:	1.8.25
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:17 PM
DATE MODIFIED:	6/16/2021 2:43 AM

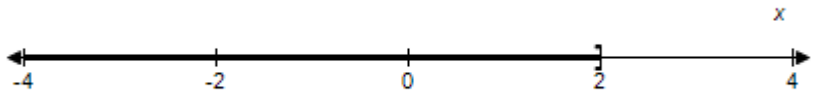
14. Solve the inequality and graph the solution on the real number line.

$x^3 + 2x^2 - 4x - 8 \le 0$

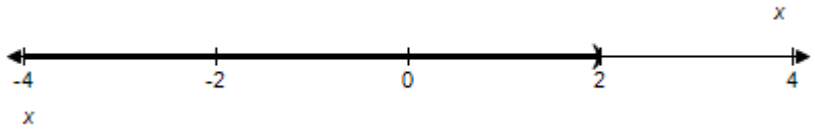
a. $(-\infty, 2]$

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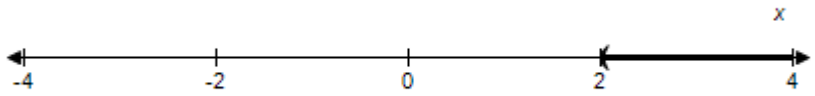
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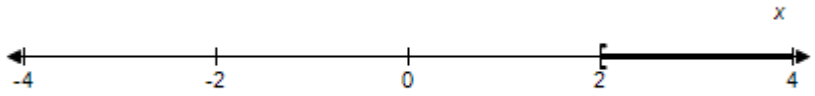
b. $(-\infty, 2)$



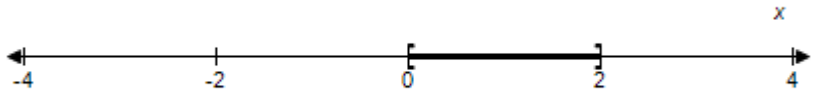
c. $(2, \infty)$



d. $[2, \infty)$



e. $[0,2]$



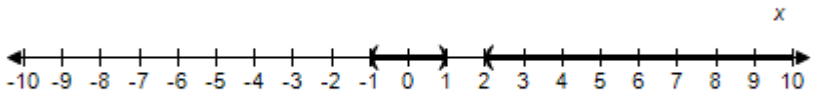
ANSWER: a
POINTS: 1
REFERENCES: 1.8.26
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 2:58 AM

15. Solve the inequality and graph the solution on the real number line.

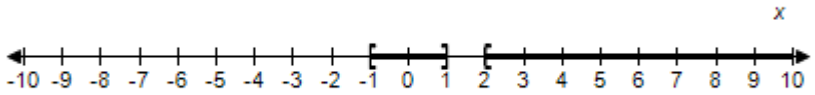
$x^3 - 2x^2 - x > -2$

a. $(-1, 1) \cup (2, \infty)$

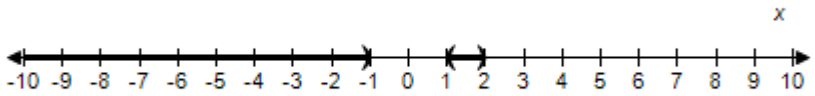
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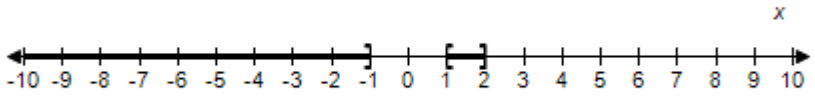
b. $[-1, 1] \cup [2, \infty)$



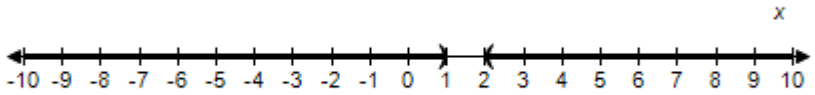
c. $(-\infty, -1) \cup (1, 2)$



d. $(-\infty, -1] \cup [1, 2]$



e. $(-\infty, 1) \cup (2, \infty)$



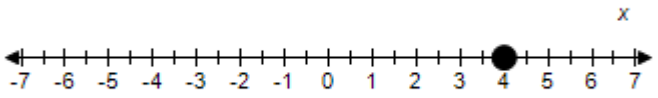
ANSWER: a
POINTS: 1
REFERENCES: 1.8.27
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 3:30 AM

16. Solve the inequality and graph the solution on the real number line.

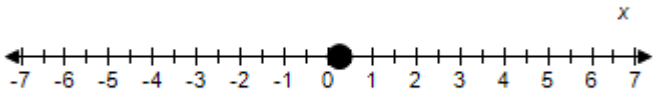
$16x^2 - 8x + 1 \leq 0$

a. $x = 4$

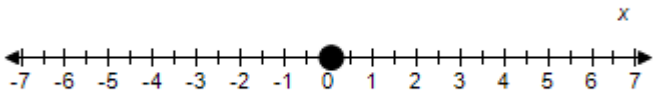
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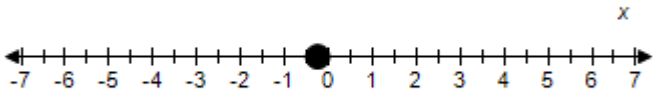
b. $x = \frac{1}{4}$



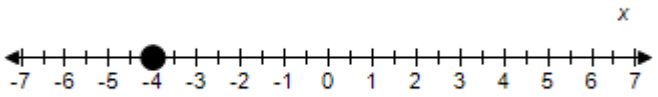
c. $x = \frac{1}{16}$



d. $x = -\frac{1}{4}$



e. $x = -4$



ANSWER:	b
POINTS:	1
REFERENCES:	1.8.29
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
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DATE MODIFIED:	6/16/2021 4:03 AM

17. Solve the inequality and graph the solution on the real number line.

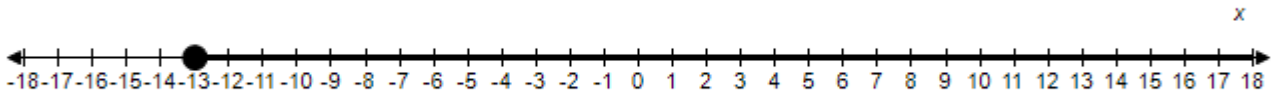
$x^2 + 3x + 13 > 0$

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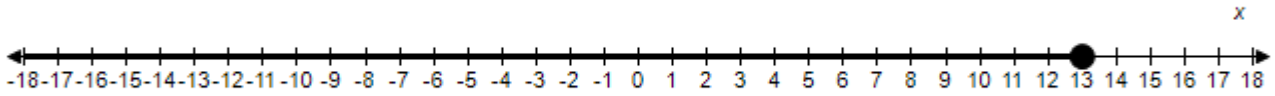
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Section 2.7 - Nonlinear Inequalities

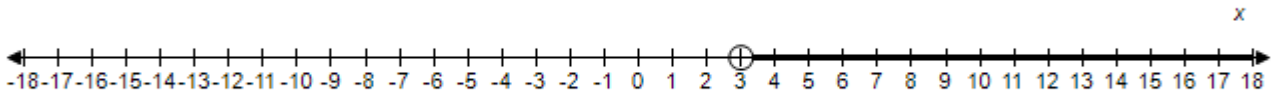
a. $x \geq -13$



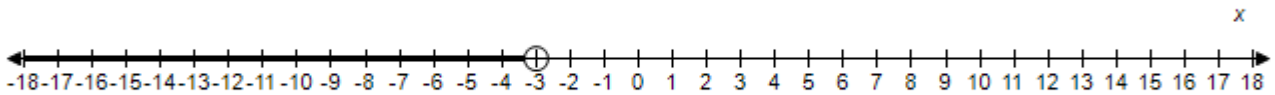
b. $x \leq 13$



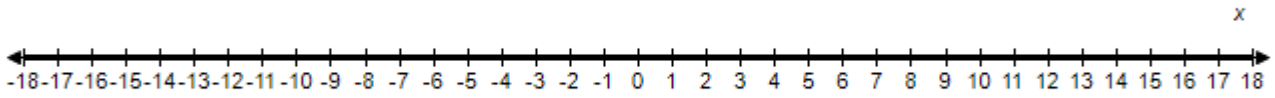
c. $x > 3$



d. $x < -3$



e. All real numbers



ANSWER:	e
POINTS:	1
REFERENCES:	1.8.30
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:17 PM
DATE MODIFIED:	6/16/2021 4:15 AM

18. Solve the inequality and write the solution set in interval notation.

$6x^2 - 10x < 0$

a. $(-\infty, 0)] \cup [\frac{5}{3}, \infty)$

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b. $\emptyset$

c. $(-\infty, 0) \cup (\frac{5}{3}, \infty)$

d. $[-\frac{5}{3}, \infty)$

e. $(0, \frac{5}{3})$

ANSWER: e
POINTS: 1
REFERENCES: 1.8.31
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 4:22 AM

19. Solve the inequality and write the solution set in interval notation.

$8x^3 - 24x^2 > 0$

a. $(3, \infty)$

b. $(-\infty, -3)$

c. $(-3, \infty)$

d. $(-\infty, 3)$

e. $(-\infty, 8)$

ANSWER: a
POINTS: 1
REFERENCES: 1.8.32
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 4:30 AM

20. Solve the inequality and write the solution set in interval notation.

$x^3 - 36x \geq 0$

a. $[-6, 0] \cup [6, \infty]$

b. $[-6, 0] \cup [6, \infty)$

c. $[-36, 0] \cup [6, \infty]$

d. $[-36, \infty)$

e. $[-6, 0] \cap [6, \infty)$

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Section 2.7 - Nonlinear Inequalities

ANSWER: b
POINTS: 1
REFERENCES: 1.8.33
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 4:39 AM

21. Solve the inequality and write the solution set in interval notation.

$x^4(x-7) \leq 0$

a. $(-\infty, 7]$
b. $(-\infty, -7)$
c. $(-\infty, -7]$
d. $(-7, 7]$
e. $(-\infty, 7)$

ANSWER: a
POINTS: 1
REFERENCES: 1.8.36
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 4:44 AM

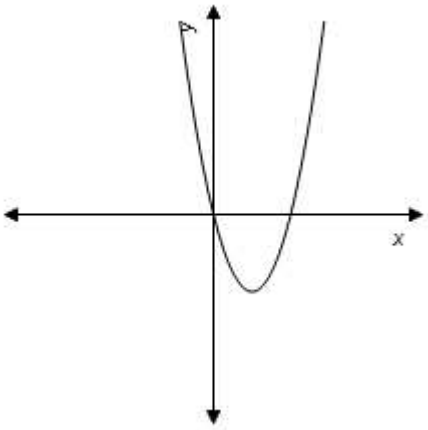
22. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the inequality.

Equation:
$y = \frac{1}{4}x^2 - 4x + 1$

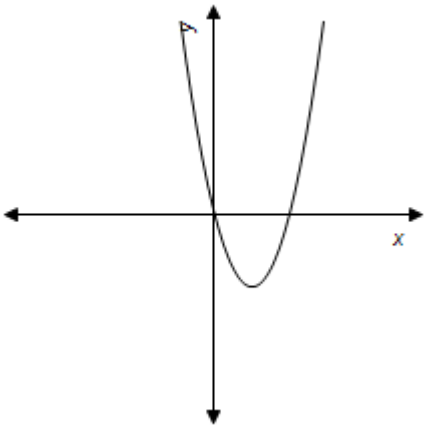
Inequality:
$y \leq 0$

a. b.

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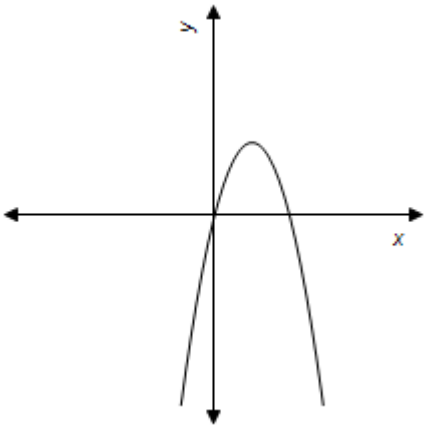


$0 \le x \le 16$



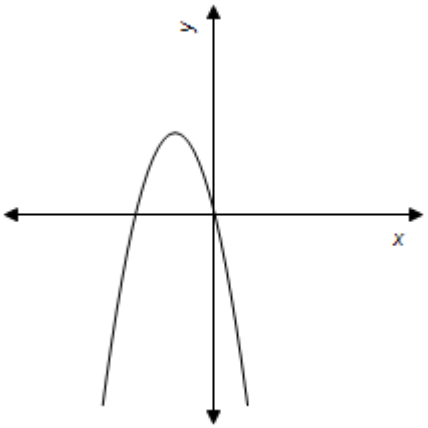
$8 - 2\sqrt{15} \le x \le 8 + 2\sqrt{15}$

c.



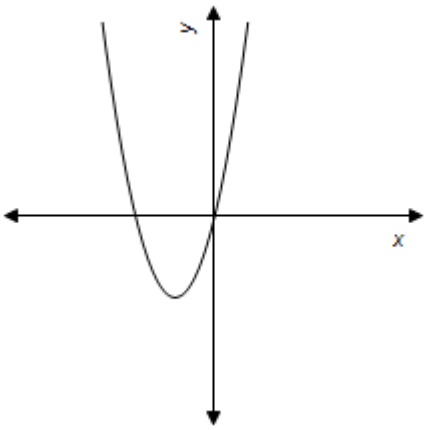
$x \le 8 - 2\sqrt{15}, x \ge 8 + 2\sqrt{15}$

d.



$x \le -8 - 2\sqrt{17}, x \ge -8 + 2\sqrt{17}$

e.



$-8 - 2\sqrt{17} \le x \le -8 + 2\sqrt{17}$

ANSWER: b
POINTS: 1
REFERENCES: 1.8.38

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Section 2.7 - Nonlinear Inequalities

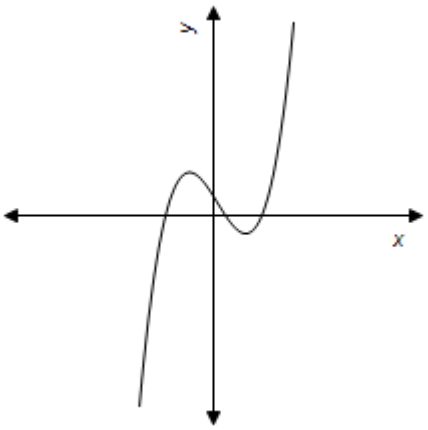
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 6:52 AM

23. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the inequality.

Equation:
$y = x^3 - x^2 - 16x + 16$

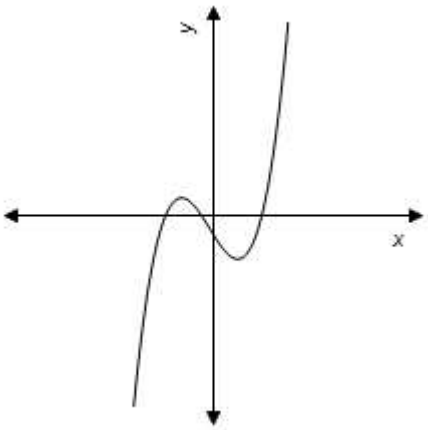
Inequality:
$y \leq 0$

a.



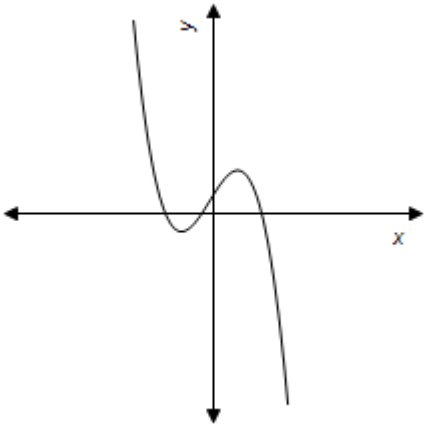
$-4 \leq x \leq 1$
$4 \leq x < \infty$

b.



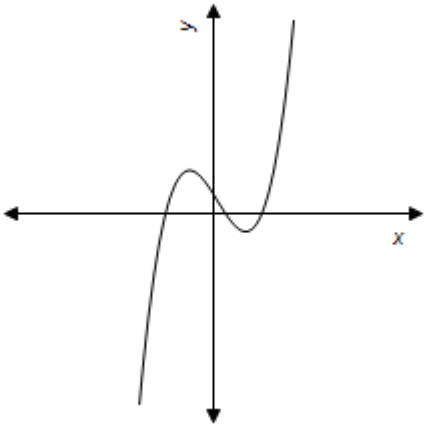
$-\infty < x \leq -4$
$-1 \leq x \leq 4$

c.



$-4 \leq x \leq -1$
$4 \leq x < \infty$

d.



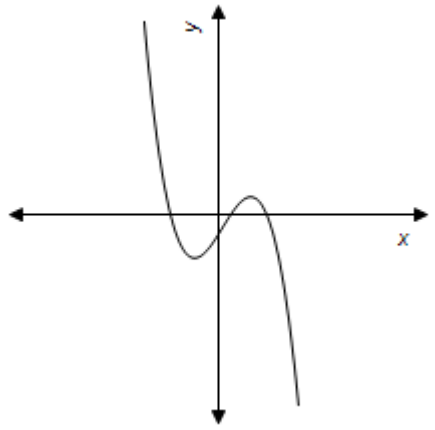
$-\infty < x \leq -4$
$1 \leq x \leq 4$

e.

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Section 2.7 - Nonlinear Inequalities



$-4 \le x \le 1$

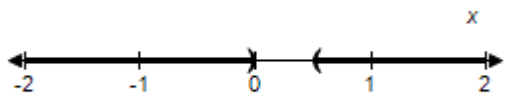
$4 \le x < \infty$

ANSWER: d
POINTS: 1
REFERENCES: 1.8.40a
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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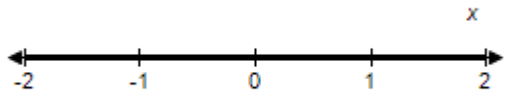
24. Solve the inequality and graph the solution on the real number line.

$$\frac{2x-1}{x} > 0$$

a. $(-\infty, 0) \cup \left(\frac{1}{2}, \infty\right)$

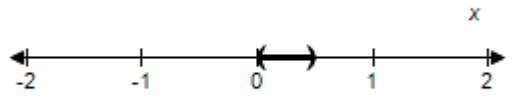


b. $(-\infty, \infty)$

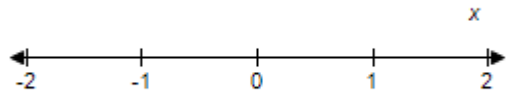


c. $\left(0, \frac{1}{2}\right)$

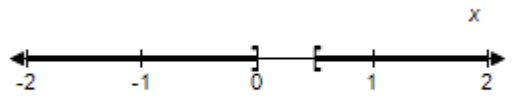
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d. $(-\infty, 0) \cap \left(\frac{1}{2}, \infty\right]$



e. $(-\infty, 0] \cup [1/2, \infty)$

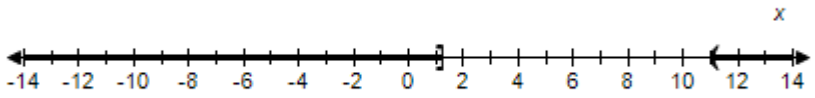


ANSWER: a
POINTS: 1
REFERENCES: 1.8.41
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 8:37 AM

25. Solve the inequality and graph the solution on the real number line.

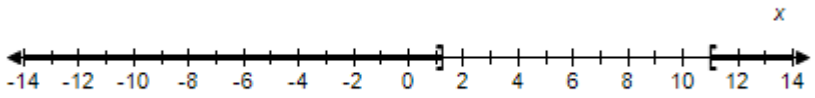
$$\frac{9x-11}{x-11} \geq 0$$

a. $\left(-\infty, \frac{11}{9}\right] \cup (11, \infty)$

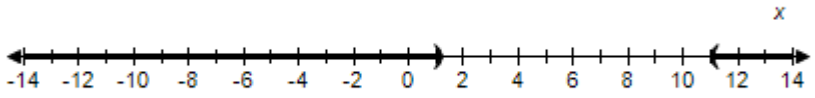


b. $\left(-\infty, \frac{11}{9}\right] \cup [11, \infty)$

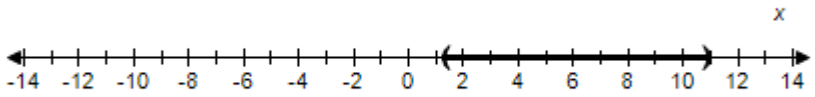
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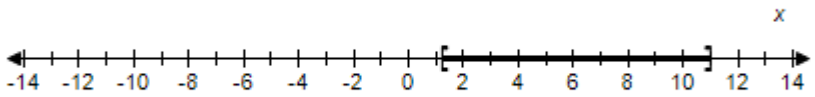
c. $\left(-\infty, \frac{11}{9}\right] \cup (11, \infty)$



d. $\left(\frac{11}{9}, 11\right]$



e. $\left[\frac{11}{9}, 11\right]$



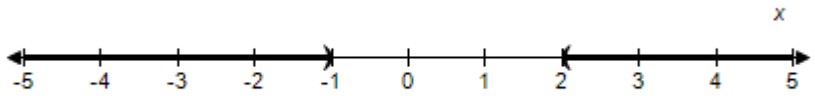
ANSWER: a
POINTS: 1
REFERENCES: 1.8.43
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 8:55 AM

26. Solve the inequality and graph the solution on the real number line.

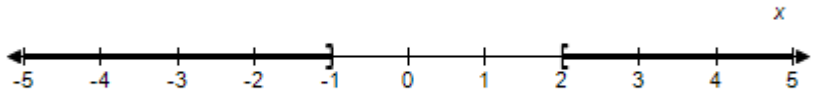
$$\frac{x+4}{x+1} - 2 < 0$$

a. $(-\infty, -1) \cup (2, \infty)$

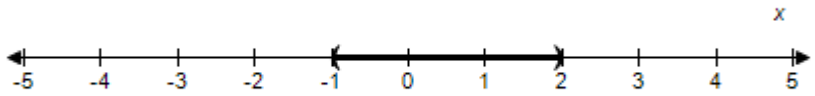
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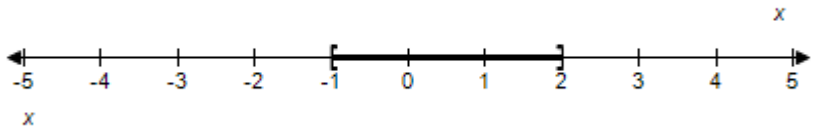
b. $(-\infty, -1] \cup [2, \infty)$



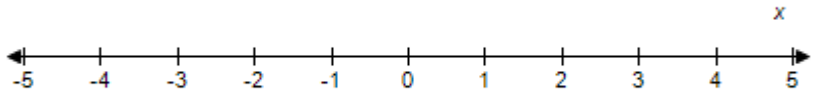
c. $(-1,2)$



d. $[-1,2]$



e. $(-\infty, -1) \cap (2, \infty)$



ANSWER: a
POINTS: 1
REFERENCES: 1.8.45
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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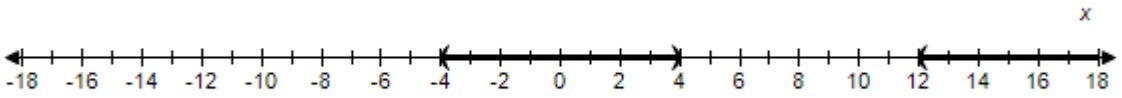
27. Solve the inequality and graph the solution on the real number line.

$$\frac{2}{x+4} > \frac{1}{x-4}$$

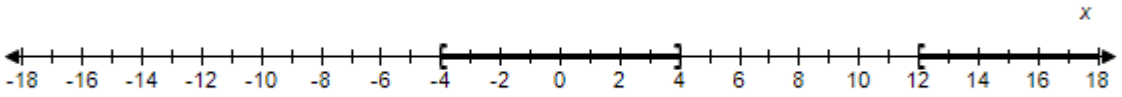
a. $(-4, 4) \cup (12, \infty)$

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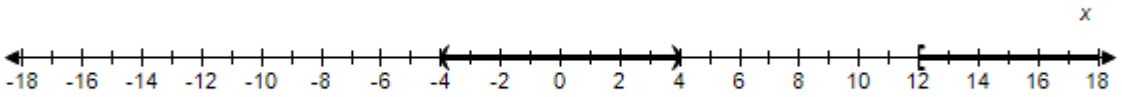
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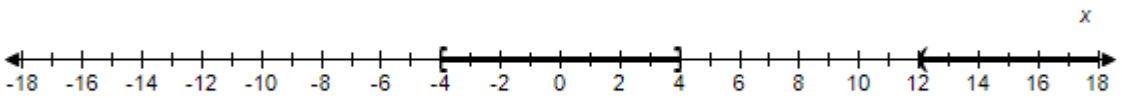
b. $[-4, 4] \cup [12, \infty)$



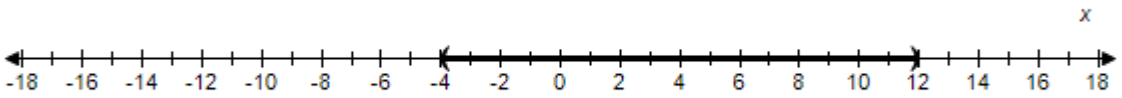
c. $(-4, 4) \cup [12, \infty)$



d. $[-4, 4] \cup (12, \infty)$



e. $(-4, 12)$



ANSWER: a
POINTS: 1
REFERENCES: 1.8.47
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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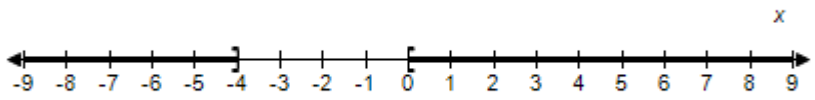
28. Solve the inequality and graph the solution on the real number line.

$$\frac{1}{x} \geq \frac{1}{x+4}$$

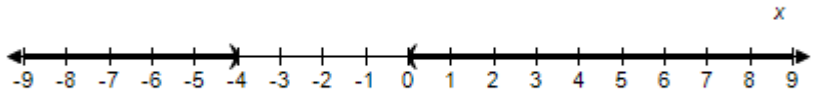
a. $(-\infty, -4] \cup [0, \infty)$

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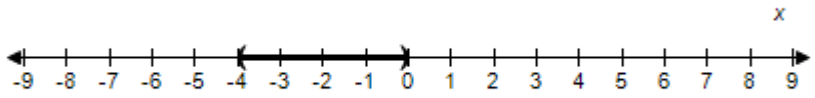
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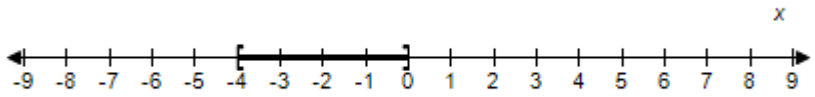
b. $(-\infty, -4) \cup (0, \infty)$



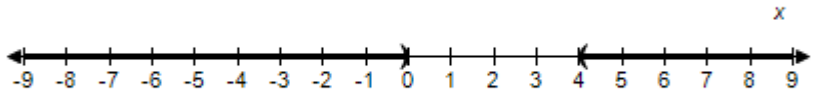
c. $(-4,0)$



d. $[-4,0]$



e. $(-\infty, 0) \cup (4, \infty)$



ANSWER: b
POINTS: 1
REFERENCES: 1.8.50
QUESTION TYPE: Multi-Mode (Multiple choice)
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STUDENT ENTRY MODE: Basic
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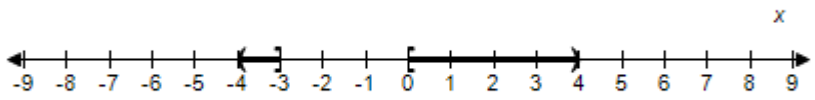
29. Solve the inequality and graph the solution on the real number line.

$$\frac{x^2+3x}{x^2-16} \le 0$$

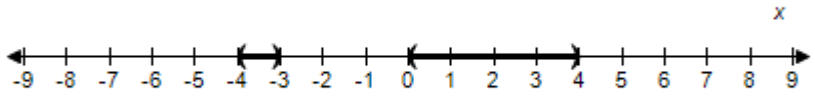
a. $(-4, -3] \cup [0, 4)$

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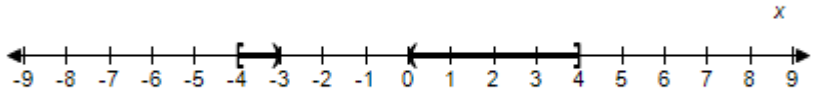
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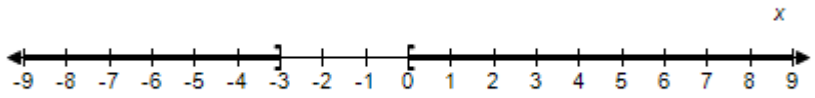
b. $(-4, -3) \cup (0, 4)$



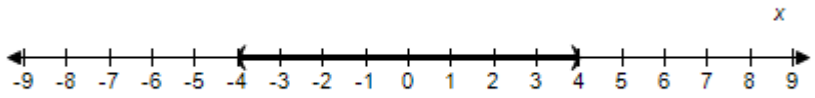
c. $[-4, -3) \cup (0, 4]$



d. $(-\infty, -3] \cup [0, \infty)$



e. $(-4,4)$



ANSWER:	a
POINTS:	1
REFERENCES:	1.8.51
QUESTION TYPE:	Multi-Mode (Multiple choice)
HAS VARIABLES:	True
STUDENT ENTRY MODE:	Basic
DATE CREATED:	6/10/2014 4:17 PM
DATE MODIFIED:	6/16/2021 10:13 AM

30. Solve the inequality and graph the solution on the real number line.

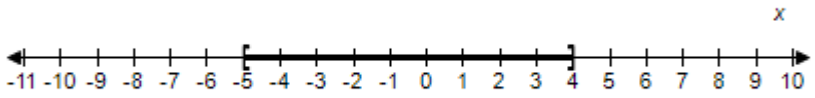
$$\frac{x^2+x-20}{x} \geq 0$$

a. $[-5, 4]$

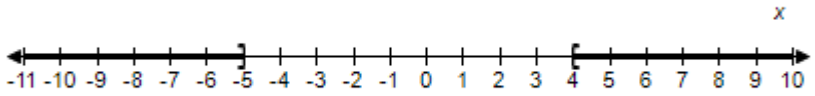
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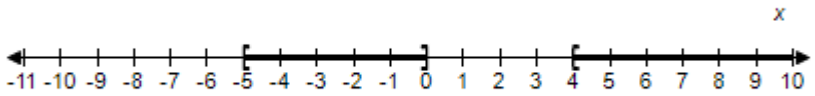
Section 2.7 - Nonlinear Inequalities



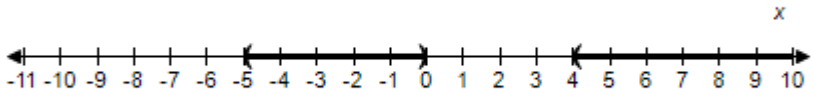
b. $(-\infty, -5] \cup [4, \infty)$



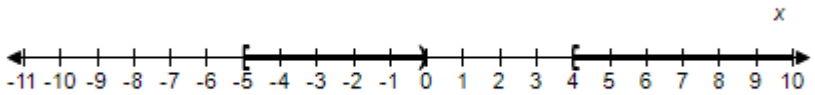
c. $[-5, 0] \cup [4, \infty)$



d. $(-5, 0) \cup (4, \infty)$



e. $[-5, 0) \cup [4, \infty)$



ANSWER: e
POINTS: 1
REFERENCES: 1.8.52
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/16/2021 10:26 AM

31. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the inequality.

Equation:
$y = \dfrac{4x}{x-3}$

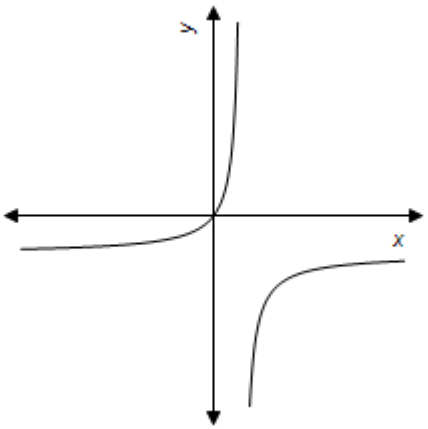
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Section 2.7 - Nonlinear Inequalities

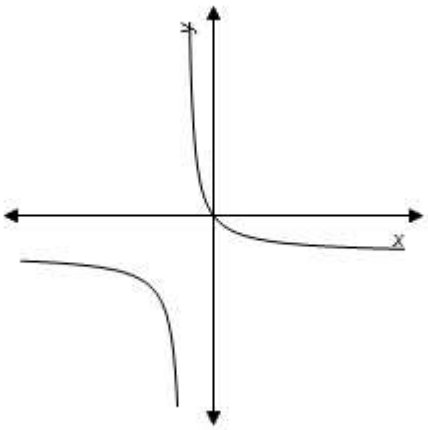
Inequality:
$y \geq 9$

a.



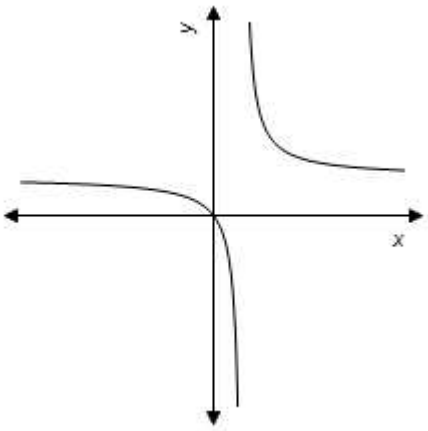
$\frac{27}{13} \leq x < 3$

b.



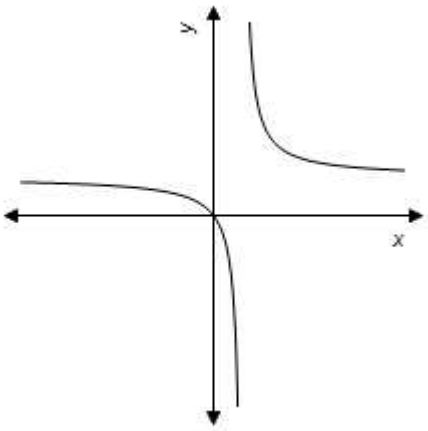
$-3 < x \leq -\frac{27}{13}$

c.



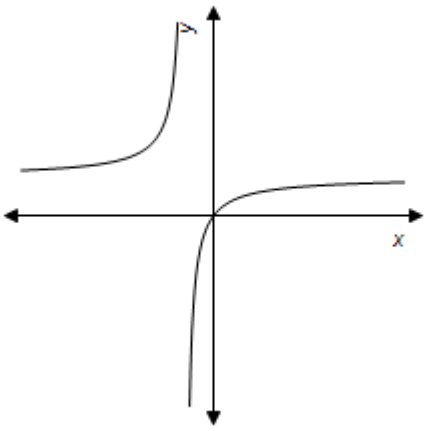
$x < 3, x \geq \frac{27}{5}$

d.



$3 < x \leq \frac{27}{5}$

e.



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Section 2.7 - Nonlinear Inequalities

$$-\frac{27}{5} \le x < -3$$

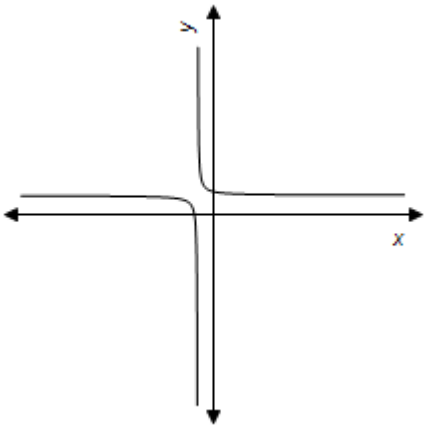
ANSWER: d
POINTS: 1
REFERENCES: 1.8.55
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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DATE MODIFIED: 6/16/2021 11:03 AM

32. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the inequality.

Equation:
$y = \dfrac{6(x-6)}{x+5}$

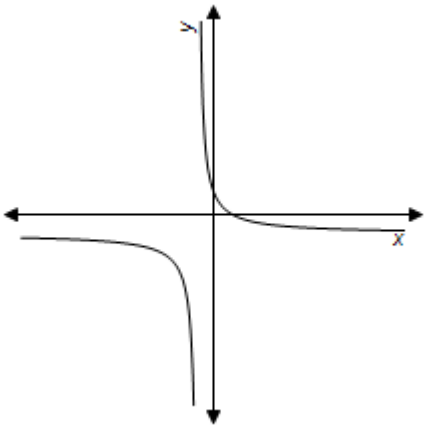
Inequality:
$y \le 0$

a.



$-6 \le x < -5$

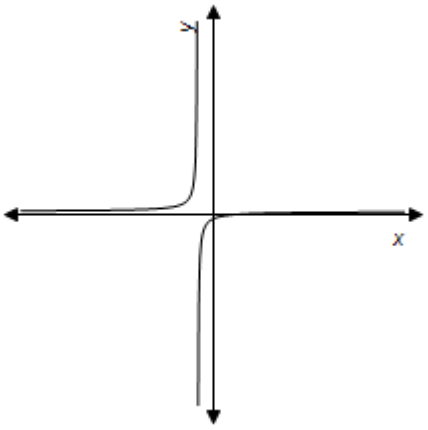
b.



$x < -5$
$x \ge 6$

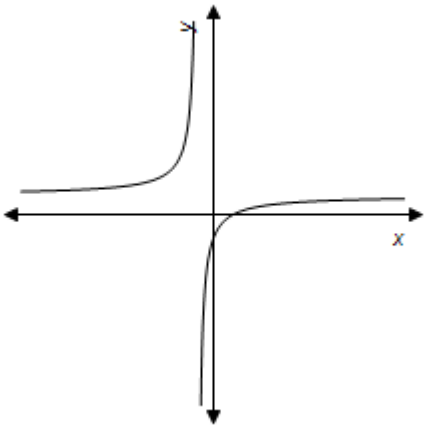
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c.



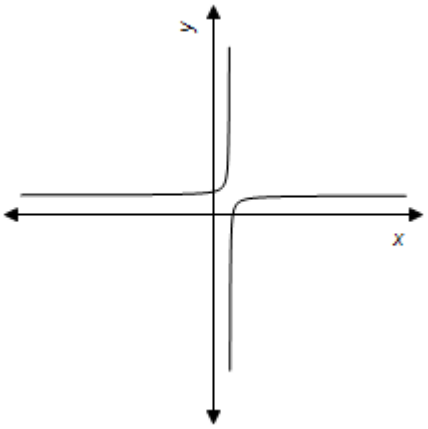
$-5 < x \leq 6$

d.



$-5 < x \leq 6$

e.



$5 < x \leq 6$

ANSWER: d
POINTS: 1
REFERENCES: 1.8.56a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 2:18 AM

33. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the inequality.

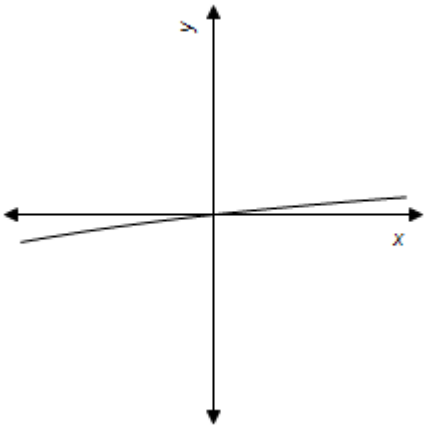
Equation:
$y = \dfrac{9x^2}{x^2 + 81}$

Inequality:
$y \leq 2$

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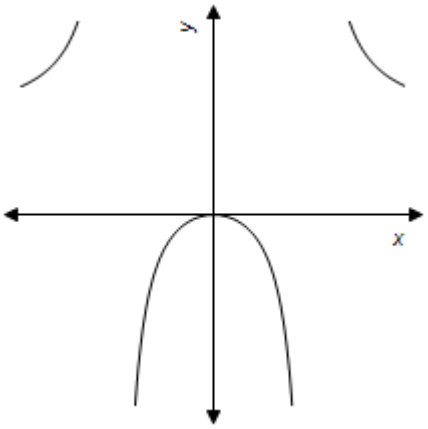
Section 2.7 - Nonlinear Inequalities

a.



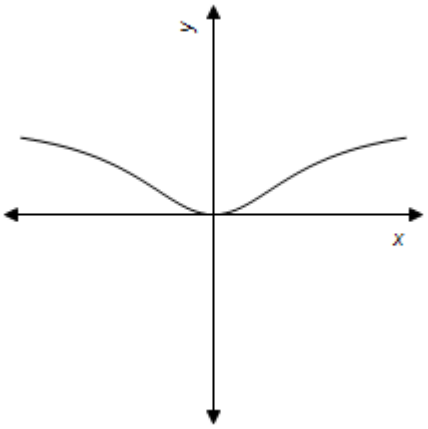
$-81 < x \leq \frac{162}{7}$

b.



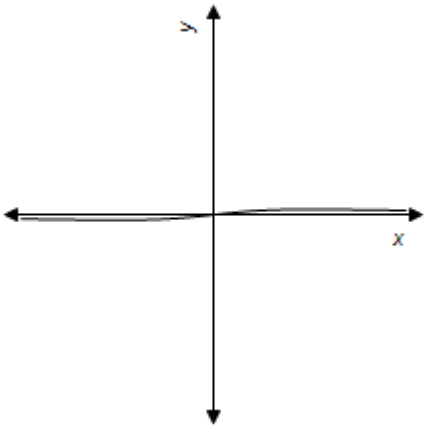
$-9 < x < 9$

c.



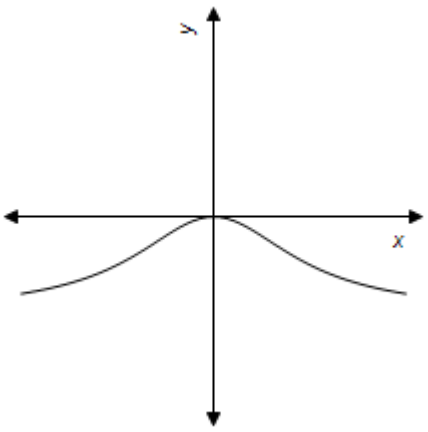
$-9\sqrt{\frac{2}{7}} \leq x \leq 9\sqrt{\frac{2}{7}}$

d.



$-\infty < x < \infty$

e.



$-\infty < x < \infty$

ANSWER: c

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Section 2.7 - Nonlinear Inequalities

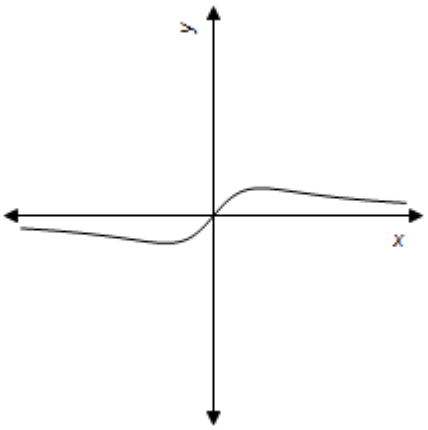
POINTS: 1
REFERENCES: 1.8.57b
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 2:54 AM

34. Use a graphing utility to graph the equation. Use the graph to approximate the values of x that satisfy the following inequality.

Equation:
$y = \dfrac{7x}{x^2+6}$

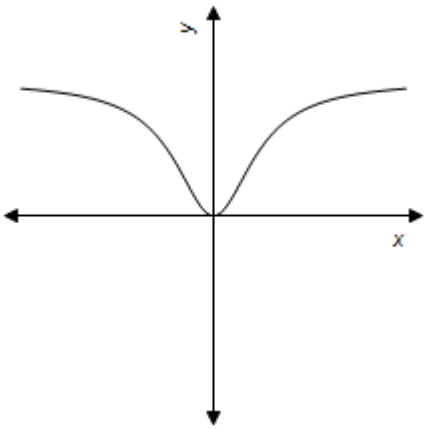
Inequality:
$y \geq 1$

a.



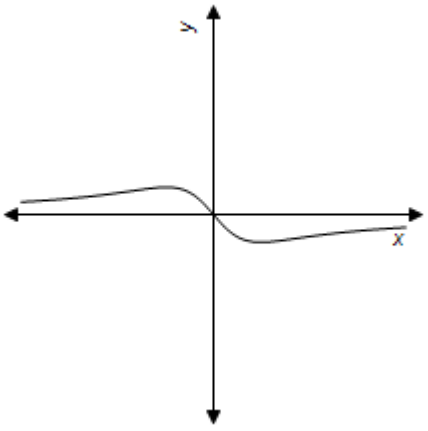
$1 \leq x \leq 6$

b.



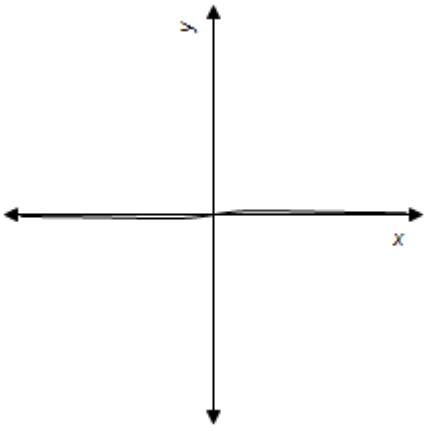
$x \leq -1$
$x \geq 1$

c.



$-6 \leq x \leq -1$

d.

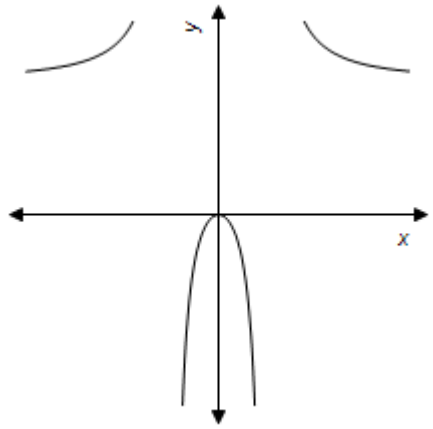


No solutions exist.

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e.



$x < -\sqrt{6}$

$x > \sqrt{6}$

ANSWER: a
POINTS: 1
REFERENCES: 1.8.58a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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35. Find the domain of x in the expression.

$\sqrt{25-x^2}$

a. $(-25, 25)$
b. $[-25, 25]$
c. $(-5, 5)$
d. $[-5, 25)$
e. $[-5, 5]$

ANSWER: e
POINTS: 1
REFERENCES: 1.8.59
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
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36. Find the domain of x in the expression.

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$\sqrt{x^2-4}$

a. $(-\infty, 2] \cap [2, \infty)$
b. $(-\infty, -2] \cup [2, \infty)$
c. $(-\infty, -2] \cap [2, \infty)$
d. $(-\infty, 2] \cup [2, \infty)$
e. $(-\infty, -2) \cup [2, \infty)$

ANSWER: b
POINTS: 1
REFERENCES: 1.8.60
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 5/13/2015 8:46 AM

37. Find the domain of x in the expression.

$\sqrt{x^2-11x+30}$

a. $(-\infty, 5] \cup [6, \infty)$
b. $(-\infty, 5] \cap [6, \infty)$
c. $(-\infty, -6] \cup [-5, \infty)$
d. $[5,6]$
e. $(-\infty, \infty)$

ANSWER: a
POINTS: 1
REFERENCES: 1.8.61
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 3:49 AM

38. Find the domain of x in the expression.

$\sqrt{36-25x^2}$

a. $(-\infty, \infty)$
b. $(-\infty, -6/5] \cup [6/5, \infty)$

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c. $\left[-\frac{6}{5}, \frac{6}{5}\right]$

d. $\left[-\frac{5}{6}, \frac{5}{6}\right]$

e. $[0, \infty)$

ANSWER: c
POINTS: 1
REFERENCES: 1.8.62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 4:00 AM

39. Find the domain of x in the expression.

$$\sqrt{\frac{x}{x^2-2x-24}}$$

a. $(-4, 0] \cap (6, \infty)$

b. $(-6, 0] \cup (4, \infty)$

c. $(-4, 0] \cup (6, \infty)$

d. $(-4, 0] \cup (-6, \infty)$

e. $(-6, 0] \cap (-4, \infty)$

ANSWER: c
POINTS: 1
REFERENCES: 1.8.63
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 9/25/2014 4:52 AM

40. Find the domain of x in the expression.

$$\sqrt{\frac{x}{x^2-9}}$$

a. $(-9, 0] \cup (9, \infty)$

b. $(-3, 0] \cup [3, \infty)$

c. $(-9, 0] \cap (3, \infty)$

d. $(-3, 0] \cup (3, \infty)$

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e. $(-9, 0] \cap [3, \infty)$

ANSWER: d
POINTS: 1
REFERENCES: 1.8.64
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 4:06 AM

41. Use the position equation $s = -4.9\,t^2 + v_0 t + s_0$, where s represents the height of an object (in meter), v_0 represents the initial velocity of the object (in meter per second), s_0 represents the initial height of the object (in meter), and t represents the time (in seconds).
A projectile is fired straight upward from ground level $(s_0 = 0)$ with an initial velocity of 54 meter per second. At what instant will it be back at ground level? (Give the answer to the nearest second.)

a. $t = 11$ sec
b. $t = 16$ sec
c. $t = 13$ sec
d. $t = 12$ sec
e. $t = 10$ sec

ANSWER: a
POINTS: 1
REFERENCES: 1.8.71a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 4:10 AM

42. Use the position equation $s = -4.9\,t^2 + v_0 t + s_0$, where s represents the height of an object (in meter), v_0 represents the initial velocity of the object (in meter per second), s_0 represents the initial height of the object (in meter), and t represents the time (in seconds).
A projectile is fired straight upward from ground level $(s_0 = 0)$ with an initial velocity of 49 meter per second. At what instant will it be back at ground level? (Give the answer to the nearest second.)

a. $t = 8$ sec
b. $t = 10$ sec
c. $t = 12$ sec
d. $t = 11$ sec
e. $t = 9$ sec

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ANSWER: b
POINTS: 1
REFERENCES: 1.8.72a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 5/16/2015 3:10 AM

43. A rectangular playing field with a perimeter of 96 meters is to have an area of at least 407 square meters. Within what bounds must the length of the rectangle lie?

a. $12m \leq L \leq 407m$
b. $37m \leq L \leq 96m$
c. $11m \leq L \leq 37m$
d. $13m \leq L \leq 39m$
e. $12m < L < 407m$

ANSWER: c
POINTS: 1
REFERENCES: 1.8.73
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 4:20 AM

44. A rectangular parking lot with a perimeter of 442 m is to have an area of at least 8050 square meter. Within what bounds must the length of the rectangle lie?

a. $442 \text{ m} \leq L \leq 8050 \text{ m}$
b. $48 \text{ m} \leq L \leq 177 \text{ m}$
c. $49 \text{ m} \leq L \leq 178 \text{ m}$
d. $47 \text{ m} \leq L \leq 8050 \text{ m}$
e. $46 \text{ m} \leq L \leq 175 \text{ m}$

ANSWER: e
POINTS: 1
REFERENCES: 1.8.74
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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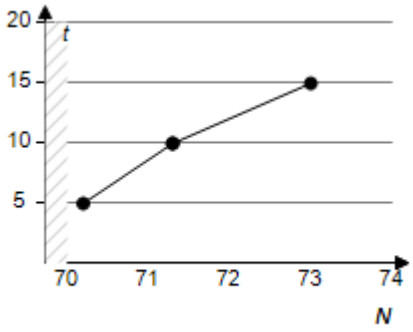
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45. The numbers N (in millions) of students enrolled in schools in the United States from 1995 through 1997 are shown in the table.

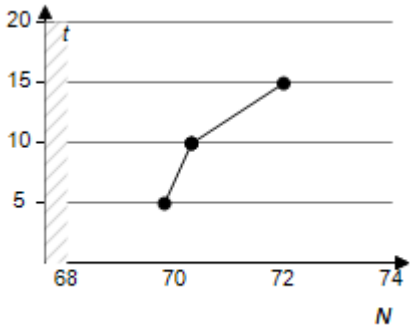
Year	Number, N
1995	70.2
1996	71.3
1997	73

Use a graphing utility to create a scatter plot of the data. Let t represent the year, with $t = 5$ corresponding to 1995, $t = 10$ corresponding to 1996, and $t = 15$ corresponding to 1997.

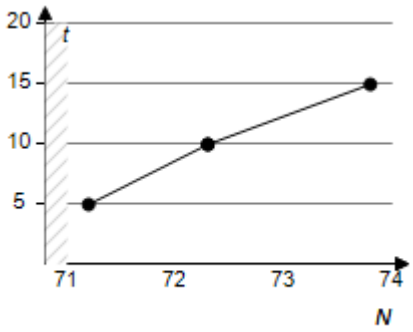
a.



b.



c.

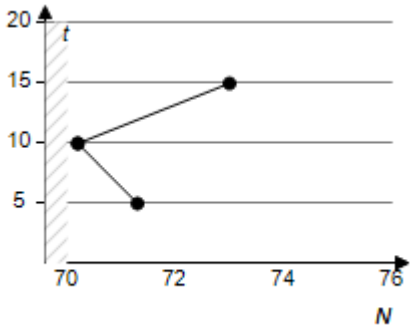


d.

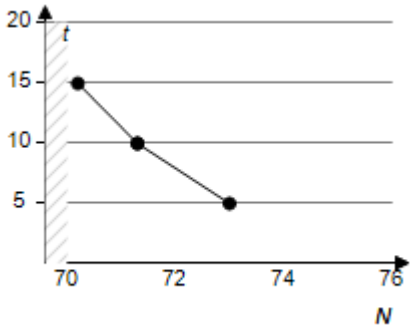
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Section 2.7 - Nonlinear Inequalities



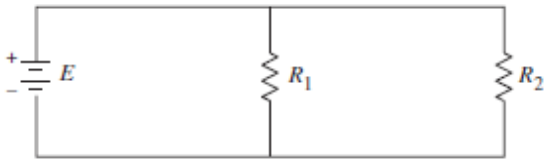
e.



ANSWER: a
POINTS: 1
REFERENCES: 1.8.77a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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46. When two resistors of resistances R_1 and R_2 are connected in parallel (see figure), the total resistance R satisfies the equation

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}.$$



Find R_1 for a parallel circuit in which $R_2 = 7$ ohms and R must be at least 1 ohm.

a. $R_1 \leq 7$ ohms

b. $R_1 < 7$ ohms

c. $R_1 \geq \frac{7}{6}$ ohms

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d. $R_1 > 7$ ohms

e. $R_1 = \frac{7}{6}$ ohms

ANSWER: c
POINTS: 1
REFERENCES: 1.8.79
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
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47. Determine whether the statement is true or false. Justify your answer.

The solution set of the inequality $\frac{7}{2}x^2 + 7x + 14 \geq 0$ is the entire set of real numbers.

a. False, the y -values are less than zero for all values of x.
b. True, the y -values are greater than zero for all values of x.

ANSWER: b
POINTS: 1
REFERENCES: 1.8.82
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 6:16 AM

48. Find the interval(s) for b such that the following equation has at least one real solution $x^2 + bx + 5 = 0$.

a. $(-\infty, -2\sqrt{5}] \cup [2\sqrt{5}, \infty)$
b. $(-\infty, -2\sqrt{5}] \cap [2\sqrt{5}, \infty)$
c. $(-\infty, -2\sqrt{5}) \cup (2\sqrt{5}, \infty)$
d. $(-\infty, -2\sqrt{5}) \cup [-2\sqrt{5}, \infty)$
e. $(-\infty, 2\sqrt{5}] \cap [2\sqrt{5}, \infty)$

ANSWER: a
POINTS: 1
REFERENCES: 1.8.83a
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic

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Section 2.7 - Nonlinear Inequalities

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49. Find the interval(s) for b such that the following equation has at least one real solution and write a conjecture about the interval(s) based on the values of the coefficients

$4x^2 + bx + 13 = 0$.

a. $(-\infty, -2\sqrt{52}] \cup [2\sqrt{52}, \infty)$

If $a > 0$ and $c > 0$, $b \le -2\sqrt{ac}$ or $b \ge 2\sqrt{ac}$

b. $(-\infty, -2\sqrt{52}] \cup [-2\sqrt{52}, \infty)$

If $a > 0$ and $c < 0$, $b \le -2\sqrt{ac}$ or $b \ge 2\sqrt{ac}$

c. $(-\infty, 2\sqrt{52}] \cup [2\sqrt{52}, \infty)$

If $a > 0$ and $c > 0$, b is all real numbers.

d. $(-\infty, 2\sqrt{52}] \cap [2\sqrt{52}, \infty)$

If $a < 0$ and $c > 0$, $b \le -2\sqrt{ac}$ or $b \ge 2\sqrt{ac}$

e. $(-\infty, -2\sqrt{52}] \cap [2\sqrt{52}, \infty)$

If $a < 0$ and $c < 0$, b is all real numbers.

ANSWER: a
POINTS: 1
REFERENCES: 1.8.85
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 6:33 AM

50. Find the interval(s) for b such that the equation has at least one real solution and write a conjecture about the interval(s) based on the values of the coefficients

$4x^2 + bx + 7 = 0$.

a. $(-\infty, -2\sqrt{28}] \cap [2\sqrt{28}, \infty)$

If $a > 0$ and $c < 0$, $b \ge -2\sqrt{ac}$

b. $(-\infty, -2\sqrt{28}] \cup [-2\sqrt{28}, \infty)$

If $a < 0$ and $c > 0$, $b \le 2\sqrt{ac}$

c. $(-\infty, -2\sqrt{28}] \cup [2\sqrt{28}, \infty)$

If $a > 0$ and $c > 0$, $b \le -2\sqrt{ac}$ or $b \ge 2\sqrt{ac}$

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d. $(-\infty, 2\sqrt{28}] \cup [2\sqrt{28}, \infty)$

If $a > 0$ and $c > 0$, b is all real numbers

e. $(-\infty, -2\sqrt{28}] \cap [2\sqrt{28}, \infty)$

If $a < 0$ and $c < 0$, $b \leq 2\sqrt{ac}$

ANSWER: c
POINTS: 1
REFERENCES: 1.8.86
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 6:32 AM

51. Determine the intervals on which the following polynomial is entirely negative and those on which it is entirely positive.
$-x^2 + 4x + 32$

a. entirely negative: $(-\infty, 6)$; entirely positive: $(6, \infty)$
b. entirely negative: $(-\infty, -4), (6, 8)$; entirely positive: $(-4, 8)$
c. entirely negative: $(-\infty, -4), (8, \infty)$; entirely positive: $(-4, 8)$
d. entirely negative: $(-4, 6)$; entirely positive: $(6, \infty)$
e. entirely negative: $(-\infty, 0)$; entirely positive: $(0, \infty)$

ANSWER: c
POINTS: 1
DIFFICULTY: Medium
REFERENCES: 47-52
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.106 - Identify intervals where graph is entirely positive and/or negative
TOPICS: 2.6
KEYWORDS: 2.6.52
NOTES: Skill
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 6:46 AM

52. Solve: $x^2 - 2x - 15 < 0$.

a. $(-\infty, -2)$
b. $(-3, \infty)$
c. $(-3, 5)$

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d. $(-\infty, 5)$

e. $(5, \infty)$

ANSWER: c
POINTS: 1
DIFFICULTY: Medium
REFERENCES: 53-62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.104 - Solve inequality
TOPICS: 2.6
KEYWORDS: 2.6.60
NOTES: Skill
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 6/17/2021 6:47 AM

53. Solve the inequality $36x - x^3 < 0$ and write the solution set in interval notation.

a. $(-\infty, -6) \cup (0, 6)$

b. $(-6, 6)$

c. $(-\infty, 6)$

d. $(-6, 0) \cup (6, \infty)$

e. $(-\infty, \infty)$

ANSWER: d
POINTS: 1
DIFFICULTY: Medium
REFERENCES: 53-62
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.104 - Solve inequality
TOPICS: 2.6
KEYWORDS: 2.6.61
NOTES: Skill
DATE CREATED: 6/10/2014 4:17 PM
DATE MODIFIED: 5/16/2015 3:26 AM

54. Find the domain of x in the following expression.
$\sqrt[3]{x^4 - 625}$

a. $[-5, 5]$

b. $(-\infty, 5) \cup (5, \infty)$

c. $[5, \infty)$

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d. $(5, \infty)$

e. all real numbers

ANSWER: e
POINTS: 1
DIFFICULTY: Medium
REFERENCES: 73-78
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.107 - Solve for the domain of an expression
TOPICS: 2.6
KEYWORDS: 2.6.76
NOTES: Skill
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DATE MODIFIED: 9/25/2014 9:53 AM

55. Find the domain of x in the expression $\sqrt{16-x^2}$.

a. $(-\infty, -4] \cup [4, \infty)$

b. $(-\infty, 4]$

c. $[-4, 4]$

d. $[-4, \infty)$

e. $(-\infty, \infty)$

ANSWER: c
POINTS: 1
DIFFICULTY: Medium
REFERENCES: 73-78
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
LEARNING OBJECTIVES: PREC.LARS.16.107 - Solve for the domain of an expression
TOPICS: 2.6
KEYWORDS: 2.6.73
NOTES: Skill
DATE CREATED: 6/10/2014 4:17 PM
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56. Find the domain of x in the expression $\sqrt[4]{x^3-14x}$.

a. $(-\infty, -\sqrt{14}] \cup [\sqrt{14}, \infty)$

b. $(-\infty, \sqrt{14}] \cup [\sqrt{14}, \infty)$

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c. $[-\sqrt{14}, 0] \cup [\sqrt{14}, \infty)$

d. $[-\sqrt{14}, \sqrt{14}]$

e. $(-\infty, -\sqrt{14}) \cup (0, \sqrt{14})$

ANSWER: c
POINTS: 1
QUESTION TYPE: Multi-Mode (Multiple choice)
HAS VARIABLES: True
STUDENT ENTRY MODE: Basic
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