Mathematical Applications for the Management Life and Social Sciences 12th edition Harshbarger Test Bank

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MULTIPLE CHOICE

1 : $x^2-3x+6=4-4x^2$
Write the equation in general form.

A :

B :

C :
Correct Answer : C
D :
2 : $(z-5)(z-6)=8$
E : Write the equation in general form.

A :

B :

C :
Correct Answer : A
D :
3 : $x^2+5x=x+12$
E : Solve the equation .

A :

B :

C :
Correct Answer : E
D :
4 : $9x^2-6x+1=0$
E : Solve the equation by factoring.

A :

B :

C :
Correct Answer : B
D :
5 : $4x^2+x+3=0$
E : Solve the equation by using the quadratic formula. Give real solutions only.

A :

B : no real solutions

C :
Correct Answer : D

E :

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6 : $6x^2 = 3x + 7$ Solve the equation by using the quadratic formula. Give real answers rounded to two decimal places.

A :

B :

Correct Answer : A

D : $y^2 = 7$ Find the exact real solutions to the equation, if they exist.

E :

A :

B :

E : no real solutions

C :

Correct Answer : D

D :

8 : $(x+7)^2 = 64$ Find the exact real solutions to the equation, if they exist.

A :

B :

C :

Correct Answer : A

D :

9 : $x^2 + 17x = 8x - 14$

E : Find the exact real solutions of the equation , if they exist.

and

A : and

and

B : and

and

C :

Correct Answer : B

D :

10 : Find the exact real solutions of the equation , i $\frac{5}{32}y^2 - \frac{11}{8}y + 1 = 0$

E : f they exist.

and

A : and

and

B : and

and

C :

Correct Answer : D

D :

E :

11 : $13x^2 = -26x - 2$
Find the exact real solutions of the equation , if they exist.
and
A : and
and
B : and
E : Real solutions do not exist.
C :
Correct Answer : B
D :
12 : $-14x + 168 - 7x^2 = 0$
Solve the equation by using a graphing utility.

A :

B :

C :
Correct Answer : A
D :
13 : $2.4z^2 - 7.4z - 2.4 = 0$
E : Solve the equation by using a graphing utility. Round your answers to two decimal places.
and
and
A : and
and
B : and

Correct Answer : C

14 : $x + \frac{4}{x} = 5$
E : Multiply both sides of the equation by the LCD, and then solve the resulting quadratic equation.

A :

B :

Correct Answer : A

15 : $\frac{x}{x-1} = 2x + \frac{1}{x-1}$
E : Solve the equation by first multiplying by the LCD, and then solving the resulting equation.

A :

B :

C :

Correct Answer : D

16 : $(x+7)^2+7(x+7)+6=0$ Solve the equation below using quadratic methods.

A :

B :

C :
Correct Answer : D
D :
17 : $p=85x-150-x^2$
E : If the profit from the sale of x units of a product is , what level(s) of production will yield a profit of $1,600?
A : less 35 units of production.
B : more than 50 units of production.
C : 85 units of production.
D : 15 units of production.
E : 35 or 50 units of production.

Correct Answer : E

18 : If a ball is thrown upward at 80 feet per second from the top of a building that is 100 feet high, the height of the ball can be modeled by , where $s=100+80t-16t^2$ t is the number of seconds after the ball is thrown. How long after it is thrown is the height 100 feet?
seconds
seconds
A : seconds
seconds
B : seconds

Correct Answer : A

19 : $p=16-0.01s^2$ The amount of airborne particulate pollution p from a power plant depends on the wind speed s, among other things, with the relationship between p and s approximated by . Find the value of s that will make .

A :

B :
Correct Answer : C
C :
20 : $S=50x-x^2$
D : The sensitivity S to a drug is related to the dosage size by , where x is the dosage size in milliliters. Determine all dosages that yield 0 sensitivity.
E : milliliters, milliliters

A :

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B :

milliliters, milliliters
milliliters, milliliters
C : milliliters, milliliters

D :

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E :

milliliters

Correct Answer : B

21 : $t = 0.001\left(0.723x^2 + 15.417x + 607.732\right)$ The time t, in seconds, that it takes a 2005 Corvette to accelerate to x mph can be described by . How fast is the Corvette going after 9.08 seconds? Give your answer to the nearest tenth.
A : 97.1 mph
B : 98.1 mph
C : 100.1 mph
D : 118.9 mph
E : 119.4 mph

Correct Answer : B

22 : $y = 0.034x^2 - 0.044x + 12.642$ Suppose that the percent of total personal income that is used to pay personal taxes is given by , where x is the number of years past 1990 (Source: Bureau of Economic Analysis, U.S. Department of Commerce). Find the year or years when the percent of total personal income used to pay personal taxes is 20 percent.
A : 2015
B : 2005
C : 2004
D : 2010
E : 2050

Correct Answer : B

23 : $s = 12t_1^2$ A fissure in the earth appeared after an earthquake. To measure its vertical depth, a stone was dropped into it, and the sound of the stones impact was heard 3.3 seconds later. The distance (in feet) the stone fell is given by , and the distance (in feet) the sound traveled is given by . In these equations, the distances traveled by the sound and the stone are the same, but their times are not. Using the fact that the total time is 3.3 seconds, find the depth of the fissure. Round your answer to two decimal places.
A : 94.19 feet
B : 91.00 feet
C : 121.98 feet
D : 126.38 feet
E : 126.48 feet

Correct Answer : C

24 : $y = 11.768x^2 - 142.214x + 493$ An equation that models the number of users of the Internet is million users, where x is the number of years past 1990 (Source: CyberAtlas, 1999). If the pattern indicated by the model remains valid, when does this model predict there will be 1,100 million users?
A : 2004
B : 2021
C : 2014
D : 2007
E : 2005

Correct Answer : E

25 : $K^2 = 18v + 3$ The model for body-heat loss depends on the coefficient of convection K, which depends on wind speed v according to the equation where v is in miles per hour. Find the positive coefficient of convection when the wind speed is 42 mph. Round your answer to the nearest integer.

A :

Correct Answer : B

26 : $y = 0.0625x^2 + x$ Find the vertex of the graph of the equation .

D :

A :

E :

B :

C :

Correct Answer : D

D :

27 : $y = \frac{1}{8}x^2 + 4$

E : Determine if the vertex of the graph of the equation is a maximum or minumim point.

A : vertex is at a maximum point

B : vertex is at a minimum point

C : has no vertex

Correct Answer : B

28 : Find the vertex of the graph of the equation . Round your answer to two decimal places. $y = 3x^2 - 4x$

A :

B :

C :

Correct Answer : A

D :

29 : $y = 2x^2 - 3x$

E : Determine what value of x gives the optimal value of the function, and determine the optimal (maximum or minimum) value. Round your answers to two decimal places.

A : optimal value of x: 0, optimal value: 1.00

B : optimal value of x: 1.13, optimal value: 0.75

C : optimal value of x: 1.50, optimal value: 1.50

D : optimal value of x: 0.75, optimal value: 1.13

E : optimal value of x: 0.75, optimal value: 1.13

Correct Answer : E

30 : $y = x^2 + 4x + 14$ Determine whether the functions vertex is a maximum point or a minimum point and find the coordinates of this point.
, a minimum point
, a maximum point
A : vertex: , a minimum point
, a maximum point
B : vertex: , a maximum point

Correct Answer : A

31 : $y = x - \frac{1}{6}x^2$ Sketch the graph of the following function.

A :

B :

C :
Correct Answer : B
D :
32 : Find the zeros, if any exist. Round your answers to two decimal places. $y = x^2 + 10x + 17$
E :
A : zeros at 2.17 and 7.83
B : zeros at 0 and 10.00
C : zeros at 11.00 and 21.00
D : no zeros
E : zeros at 0 and 27.00

Correct Answer : A

33 : $\frac{1}{6}x^2 + 3x - y - 7 = 0$ Determine whether the vertex of the graph of the following function is a maximum point or a minimum point. Also find the coordinates of the vertex.
, a maximum point
, a minimum point
A : vertex: , a minimum point
, a minimum point
B : vertex: , a maximum point

Correct Answer : B

34 : Find the x-intercepts, if any exist. Round your answers to two decimal places. $\frac{1}{6}x^2 + 3x - y - 7 = 0$

E : vertex: ,
A : x-intercepts: ,
,
B : x-intercepts:

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D : x-intercepts:

,

E : no x-intercepts

Correct Answer : C

35 : $y = x^2$
How is the graph of shifted to obtain the graph of the function ?
A : shifted 3 units to the left and 6 units up
B : shifted 3 units to the right and 6 units down
C : shifted 9 units to the left and 6 units up
D : shifted 6 units to the right and 6 units down
E : shifted 3 units to the right and 6 units up

Correct Answer : E

36 : Use a graphing utility to find the vertex of the function. Round your answer to two decimal places.
$y = \frac{1}{20}x^2 - x - \frac{27}{20}$

A : vertex: origin

B :

C : vertex:
Correct Answer : A
D : vertex:
37 :
E : vertex:
$y = \frac{1}{4}x^2 + 3x + 11$
Sketch the graph of the following function by using graphing calculator.

A :

B :

Correct Answer : D

C :

D :
38 : Find the average rate of change of the function $y = -5x - x^2$ between and .
A : 7
B : 6
C : 0
D : 6
E : 12

Correct Answer : C

39 : $y = 66 + 0.2x - 0.01x^2$
Find the vertex and then determine the range of the function.
A : all values greater than or equal to 67
B : all values less than or equal to 63
C : all values greater than or equal to 10
D : all values less than or equal to 85
E : all values less than or equal to 67

Correct Answer : E

40 : Use a graphing utility to approximate the solutions to . Round your answers to two decimal places.$f(x)=0$

A :

B :

C :
Correct Answer : C
D :
41 : $f(x)=2x^2-21x+49$
E : Factor the function .

A :

B :

C :
Correct Answer : C
D :
42 : $f(x)=0$
E : Solve for the function .

A :

B :
E : no real solutions
C :
Correct Answer : D
D :
43 : $P=20x-0.2x^2-97$ The daily profit from the sale of a product is given by dollars. What level of production maximizes profit?
A : production level of 100 units
B : production level of 10 units
C : production level of 5 units
D : production level of 50 units
E : production level of 95 units

Correct Answer : D

44 : The daily profit from the sale of a product is given by dollars. What is the maximum possible profit? Round intermediate calculations and final answer to the nearest dollar.$P=16x-0.2x^2-100$

A : $532
B : $860
C : $220
D : $40
E : $73

Correct Answer : C

45 : $P = 82x - 0.3x^2 - 180$ The daily profit from the sale of a product is given by dollars. What is the maximum possible profit? Round intermediate calculations and final answer to the nearest dollar.
A : $5,423
B : $16,685
C : $11,013
D : $137
E : $271

Correct Answer : A

46 : $Y = x(1{,}000 - x)$ The yield in bushels from a grove of orange trees is given by , where x is the number of orange trees per acre. How many trees will maximize the yield?
A : 1,000 trees
B : 2,000 trees
C : 550 trees
D : 1,050 trees
E : 500 trees

Correct Answer : E

47 : $S = 970x - x^2$ The sensitivity S to a drug is related to the dosage x in milligrams by . Use a graphing utility to determine what dosage gives maximum sensitivity.
A : 97
B : 235,225
C : 970, 0
D : 970
E : 485

Correct Answer : E

48 : $s = 121t - 16t^2$ A ball thrown vertically into the air has its height above ground given by , where t is in seconds and s is in feet. Find the maximum height of the ball.
A : 242 feet
B : 121 feet
C : 8 feet
D : 16 feet
E : 229 feet

Correct Answer : E

49 : The owner of a skating rink rents the rink for parties at $696 if 58 or fewer skaters attend, so that the cost per person is $12 if 58 attend. For each 5 skaters above 58, she reduces the price per skater by $0.50. Which table gives the revenue generated if 58, 68, and 78 skaters attend?
A :

Price	No. of skaters	Total Revenue
12	58	$780

11	68	$748
10	78	$696

B :

Price	No. of skaters	Total Revenue
12	58	$696
13	68	$748
14	78	$780

C :

Price	No. of skaters	Total Revenue
12	58	$696
11	68	$748
10	78	$780

D :

Price	No. of skaters	Total Revenue
12	58	$696
13	68	$884
14	78	$1092

E :

Price	No. of skaters	Total Revenue
12	58	$696
11.5	68	$782
11	78	$858

Correct Answer : C

50 : $y = ax^2 + bx + c$ When a stone is thrown upward, it follows a parabolic path given by a form of the equation . If represents ground level, find the equation of a stone that is thrown from ground level at and lands on the ground 130 units away if the stone reaches a maximum height of 130 units.

A :

Correct Answer : B

51:: $p(t) = -0.4375t^2 + 8.2t - 34.3625$ In 1995, Americas 45 million Social Security recipients received a 2.6% cost-of-living increase, the second smallest increase in nearly 20 years, a reflection of lower inflation. The percent increase might be described by the function , where t is the number of years past 1980. In what year does the model predict the highest cost of living percent increase?

A : 1990
B : 2009
C : 1987
D : 1989
E : none of the above

Correct Answer : D

52 : $p = \frac{1}{2}q^2 + 10$ Sketch the first quadrant portions of the following functions and estimate the market equilibrium point.Supply: Demand:

A :

B :

C :

Correct Answer : B

53 : A supply function has the equation is , $p = \frac{1}{2}q^2 + 20$ and the demand function is decribed by the equation . Algebraically determine the equilibrium point for the supply and demand functions. Round your answer to two decimal places.

A :

B :

C :

Correct Answer : D

54 : If the supply function for a commodity is and the demand function is , find the equilibrium quantity and equilibrium price. Round your final answer to two decimal places. $p = q^2 + 8q + 16$

A :

B :

C :

D :

E :

Correct Answer : E

55 : $6p - q = 60$ If the supply and demand functions for a commodity are given by and , respectively, find the price that will result in market equilibrium.

A : 41

B : 150

C : 33

D : 31

E : 25

Correct Answer : C

56 : If the supply and demand functions for a commodity are given by and , what is the equilibrium price and what is the corresponding number of units supplied and demanded? Round your answer to two decimal places. $p - q = 10$

A :

B :

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D :

E :
Correct Answer : A

57 : The supply function for a product is $2p - q - 10 = 0$, while the demand function for the same product is . Find the market equilibrium point E(q, p). Round your final answer to two decimal places.

A :

B :
Correct Answer : D
C :
58 : The supply function for a product is , while the demand function for the same product is . If a $22 tax is placed on production of the item, then the supplier passes this tax on by adding $22 to his selling price. Find the new equilibrium point E(q, p) for this product when the tax is passed on. (The new supply function is given by $2p - q - 10 = 0$.) Round your final answer to two decimal places.

A :

B :

C :
Correct Answer : D

D :
59 : $C(x) = 1{,}650 + 45x + x^2$

E : The total costs for a company are given by , and the total revenues are given by . Find the break-even points.

and units.
units.
A : Break-even values are at units.
and units.
B : Break-even values are at units.

Correct Answer : A
Break-even values are at

60 : Break-even values are at $C(x) = 9000 + 25x + \frac{1}{2}x^2,$
E : Break-even values are at $R(x) = \left(255 - \frac{1}{2}x\right)x$ If a firm has the following cost and revenue functions, find the break-even points.

and units.
and units.
A : Break-even values are at and units.
and units.
B : Break-even values are at and units.

Correct Answer : E
Break-even values are at

61 : If a company has total costs , and total revenues given by , find the break-even points. Round your answers to two decimal places.
E : Break-even values are at

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$$C(x) = 15{,}000 + 35x + 0.1x^2$$

and units.
A : Break-even values are at and units.
units.
B : Break-even values are at units.
and units.
C : Break-even values are at
Correct Answer : B
D : Break-even values are at
62 : $C(x) = 4{,}400 + 1{,}500x$ If total costs are and total revenues are , find the break-even
E : Break-even values are at points.

and units.
and units.
A : Break-even values are at and units.
and units.
B : Break-even values are at and units.

Correct Answer : B
Break-even values are at

63 : Given the profit function , and that production is restricted to fewer than 75 units, find the break-even point(s). Round your answer to two decimal places. $P(x) = -13x + 0.1x^2 + 172.5$
E : Break-even values are at
units.
A : Break-even value is at units.
units.
B : Break-even value is at units.
units.
C : Break-even value is at
Correct Answer : E
D : Break-even value is at
64 : Find the maximum revenue for the revenue function . $R(x) = 360x - 0.8x^2$
E : Break-even value is at Round your answer to the nearest cent.
A : $40,500.00
B : $121,500.00
C : $30,375.00
D : $111,375.00
E : $122,500.00

Correct Answer : A

65 : If, in a monopoly market, the demand for a product is , and the revenue function is , where x is the number of units sold, what price will maximize revenue? Round your answer to the nearest cent. $p = 180 - 0.75x$
.
.
A : Price that will maximize revenue is .
.
B : Price that will maximize revenue is .
.
C : Price that will maximize revenue is

Correct Answer : A

66 : $P(x) = 120x - x^2 - 1100$ The profit function for a certain commodity is . Find the level of production that yields maximum profit, and find the maximum profit.
A : Production levels of 120 yields a maximum profit of $1,100.
B : Production levels of 120 yields a maximum profit of $2,500.
C : Production levels of 60 yields a maximum profit of $6,040.
D : Production levels of 60 yields a maximum profit of $3,600.
E : Production levels of 60 yields a maximum profit of $2,500.

Correct Answer : E

67 : $P(x) = 80x - 0.1x^2 - 7000$ Use a graphing calculator to graph the profit function .

A :

B :

C :
Correct Answer : E
D :
68 : $P(x) = 70x - 0.1x^2 - 6000$
E : The graph of the profit function is given as follows. Consider the average rate of change of the profit from a to 350 where a lies to the left of 350. Does the average rate of change of the profit get closer to 0 or farther from 0 as a gets closer to 350?
A : closer to 0
B : farther from 0

Correct Answer : A

69 : $C(x) = 15{,}100 + 35x + 0.1x^2$ Form the profit function for the cost and revenue functions, where the total costs and total revenues are given by and .

A :

B :

Correct Answer : B

70 : Suppose a company has fixed costs of $26,000 and variable costs of dollars per unit, where x is the total number of units produced. Suppose further that the selling price of its product is dollars per unit. Find the break-even points $\frac{2}{5}x + 222$. Round your answer to the nearest cent.

and .
and .
A : Break-even values are at and .
B : Break-even values are at

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D : Break-even values are at

and .
and .

E : Break-even values are at
Correct Answer : A

71 : Suppose a company has fixed costs of $27,000 and variable costs of $\frac{2}{5}x+222$ dollars per unit, where x is the total number of units produced. Suppose further that the selling price of its product is dollars per unit. Find the maximum revenue. Round your answer to the nearest cent.
A : Maximum revenue is $1,026.70.
B : Maximum revenue is $27,000.00.
C : Maximum revenue is $26,862.50.
D : Maximum revenue is $677,343.75.
E : Maximum revenue is $612.50.

Correct Answer : D

72 : $R(t)=-0.051t^2+0.876t+0.179$ Assume that sales revenues for Continental Divide Mining can be described by , where t is the number of years past 1992. Use the function to determine the year in which maximum revenue occurs.
A : Maximum revenue occurred during 2001.
B : Maximum revenue occurred during 1992.
C : Maximum revenue occurred during 2000.
D : Maximum revenue occurred during 2009.
E : Maximum revenue occurred during 1991.

Correct Answer : C

73 : Assume that sales revenues, in millions, for Continental Divide Mining can be described by , where t is the number of years past 1992. Use the function to find the maximum revenue. Round your answers to three decimal places. $R(t)=-0.041t^2+0.776t+0.179$

A : Maximum revenue is $9.463 million.
B : Maximum revenue is $5.971 million.
C : Maximum revenue is $3.672 million.
D : Maximum revenue is $3.851 million.
E : Maximum revenue is $16.986 million.

Correct Answer : D

74 : $C(t)=-0.012t^2+0.561t+0.731$ Assume that costs and expenses for Continental Divide Mining can be described by and the sales revenue can be described by , where t is the number of years since the beginning of 1992. Find the year in which maximum profit occurs.
A : 2014
B : 1993
C : 2003
D : 2004
E : 1994

Correct Answer : C

75 : $f(x)=1$ Sketch the graph of the function .

A :

B :

C :

D :

E :

Correct Answer : C

76 : $y = \sqrt{x} - 3$ Sketch the graph of the function .

A :

B :

C :
Correct Answer : A
D :
77 : $y = \sqrt[3]{x} - 1$
E : Sketch the graph of the function .

A :

B :

C :
Correct Answer : E
D :
78 : $y = (x-2)^3 + 1$
E : Sketch the graph of the function below.

A :

B :

C :
Correct Answer : B
D :
79 : $y = |x+2|$
E : Sketch the graph of the function .

A :

B :

C :
Correct Answer : D
D :
80 :
E : $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 1 & \text{if } x \geq 0 \end{cases}$ Sketch the graph of the function .

A :

B :

C :

D :

Correct Answer : B

81 : $f(x)=\begin{cases} -1, & \text{if } x\le -1 \\ x, & \text{if } -1<x<1 \\ -x, & \text{if } x\ge 1 \end{cases}$ Sketch the graph of the function .

A :

B :

C :
Correct Answer : D
D :
82 : $y=x^3-x$
E : By recognizing shapes and features of polynomial functions, sketch the graph of the function . Use a graphing utility to confirm your graph.

A :

B :

Correct Answer : C

83 : $y=2x^2-x^4$
E : By recognizing shapes and features of polynomial functions, sketch the graph of the function . Use a graphing utility to confirm your graph.

A :

B :

Correct Answer : E

84 : $y=\dfrac{x+3}{x+2}$
E : By recognizing shapes and features of rational functions, sketch the graph of the function . Use a graphing utility to confirm your graph.

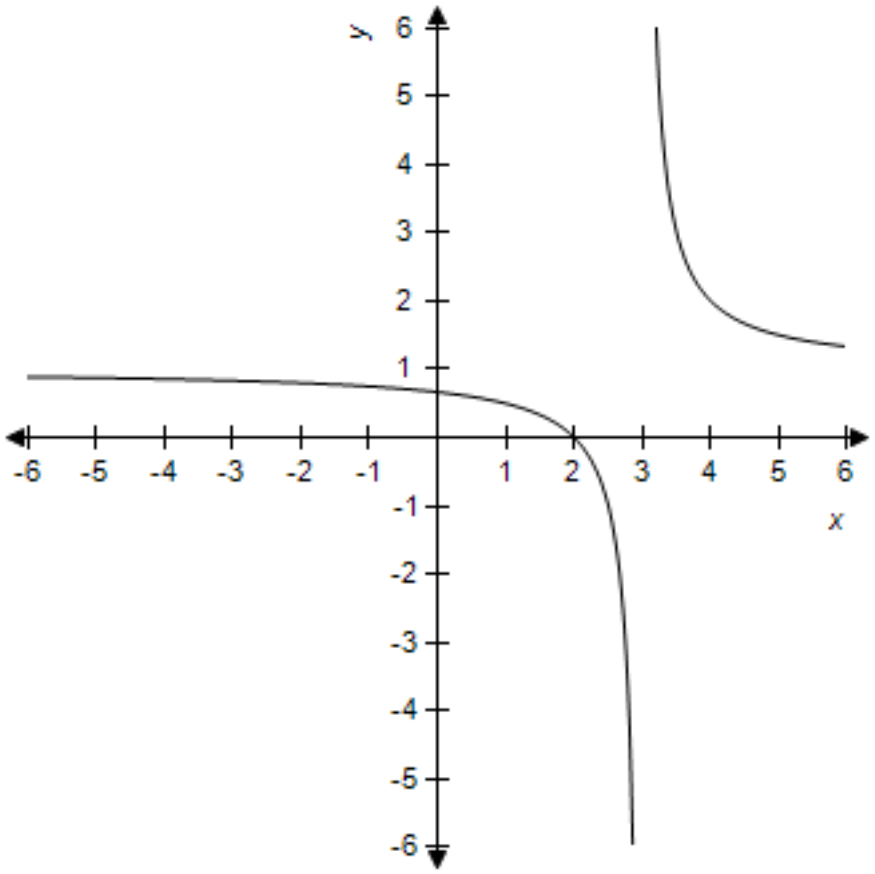
A :

B :

Correct Answer : A

85 :

E :



Find the rational function whose graph is given.

A :

B :

Correct Answer : D

86 : If , find and . Round your answers to two decimal places. $f(x) = 8x^{5/2}$

E : and
A : and
and
B : and
and
C :
Correct Answer : A
D :
87 :
E : $\text{If } k(x) = \begin{cases} -4 & \text{if } x < 0 \\ x+2 & \text{if } 0 \le x < 1 \\ 6-x & \text{if } x \ge 1 \end{cases}, \text{ find } k(-2),\ k(0), \text{ and } k(3).$

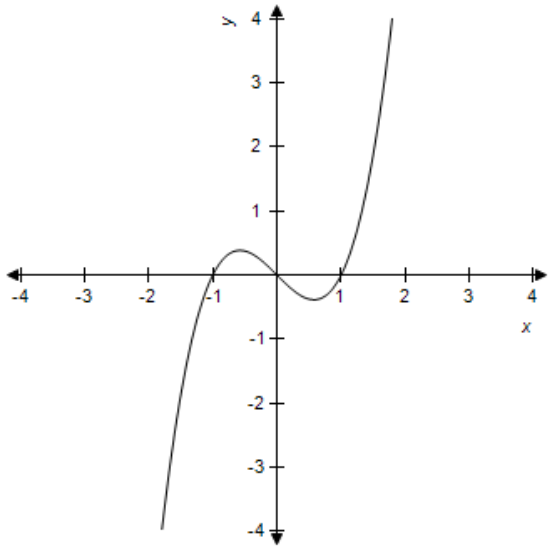
A :

B :

D :

E :
Correct Answer : C

88 : Determine whether the given graph is the graph of a polynomial function, a rational function (but not a polynomial), or a piecewise defined function. Use the graph to estimate the turning points. Round your answers to two decimal places.



and

A : polynomial functionturning points: and

, , and

B : rational functionturning points: , , and

and

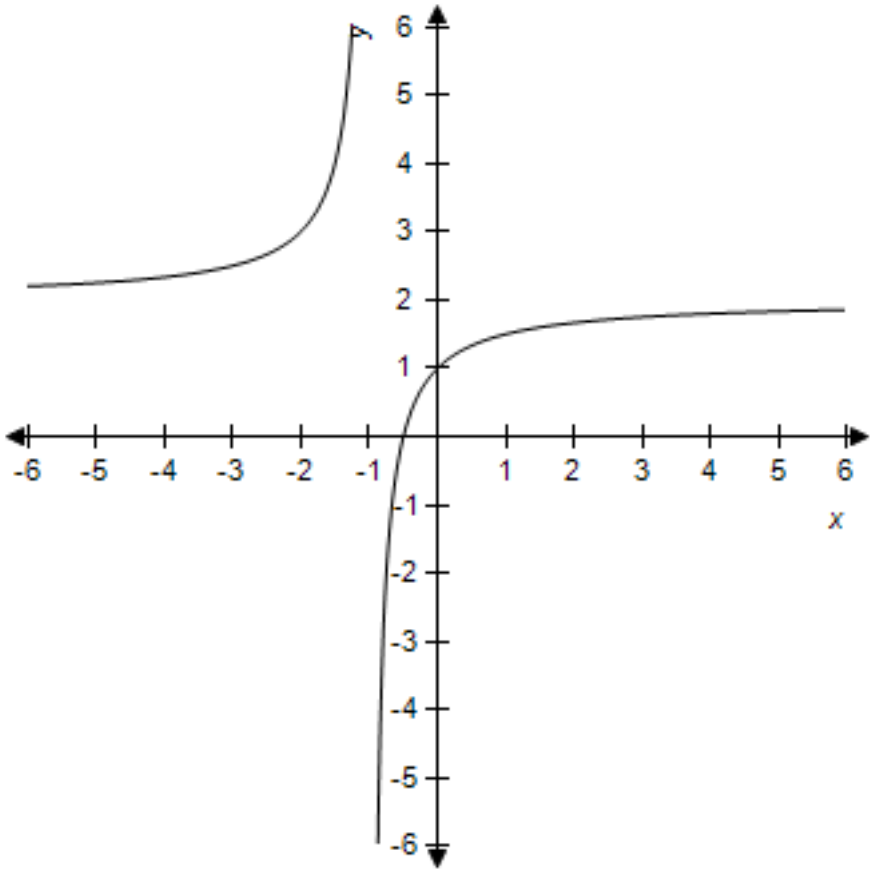
C : polynomial functionturning points:

Correct Answer : A

D : rational functionturning points:

89 :

E : p



Determine whether

the given graph is the graph of a polynomial function, a rational function (but not a polynomial), or a piecewise defined function. Use the graph to estimate the turning points and any asymptotes.
A : polynomial functionturning points:

vertical asymptote: horizontal asymptote:

B : rational functionturning points: nonevertical asymptote:

horizontal asymptote:

C : rational functionturning points: nonevertical asymptote:

horizontal asymptote:

D : piecewise functionturning points:

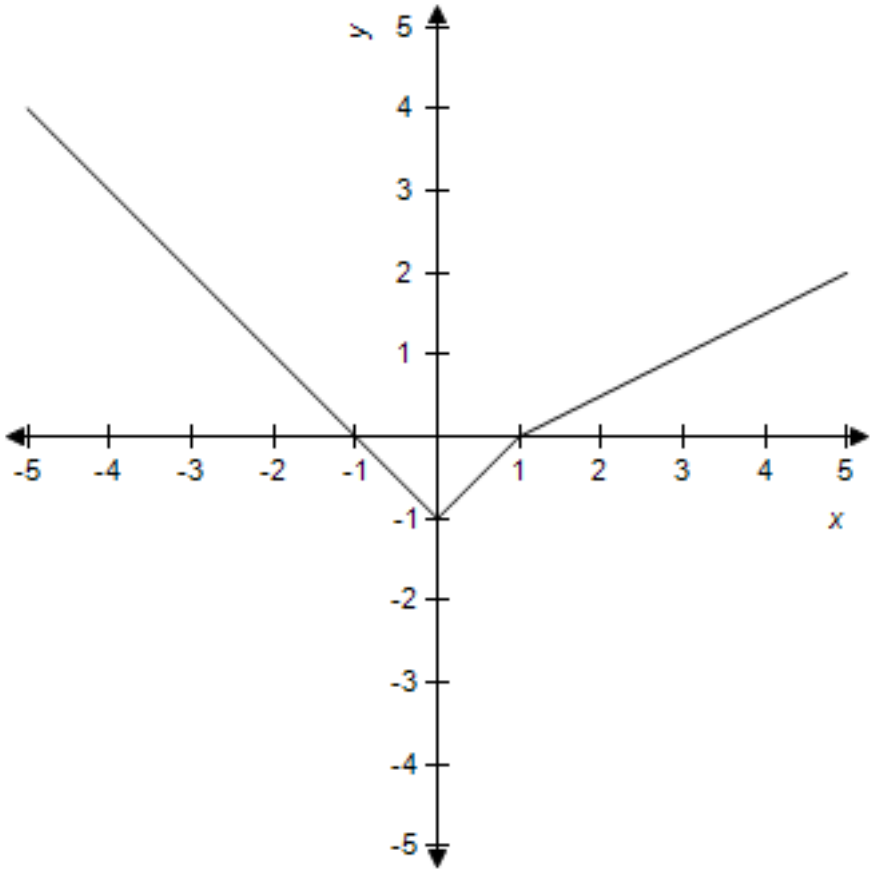
vertical asymptote: horizontal asymptote:

E : polynomial functionturning points: nonevertical asymptote:

horizontal asymptote:

Correct Answer : B

90 :



Determine whether the given graph is the graph of a polynomial function, a rational function (but not a polynomial), or a piecewise defined function. Use the graph to estimate the turning points.

and

and

A : piecewise functionturning points:

B : polynomial functionturning points:

Correct Answer : E

C : rational functionturning points:

91 : $V = x(10-2x)^2 \text{ ft}^3$

D : polynomial functionturning points:

An open-top box is constructed from a square piece of cardboard with sides of length 10 ft. The volume of such a box is given by , where x is the height of the box. Find the volume of the box if its height is 2 ft.

E : piecewise functionturning points:

A : 70.5 ft3

B : 71.5 ft3

C : 72 ft3

D : 74 ft3

E : 76.5 ft3

Correct Answer : C

92 : The amount of money invested in a certain mutual funds, measured in millions of dollars, for the years 1995 to 1999 was found to be modeled by million dollars, where x is the number of

years past 1990. Will the graph of this function bend upward or will it bend downward? How much money is predicted to be in the fund in the year 2009? Round your answer to two decimal places. $f(x) = 98.25x^{0.95}$

A : the functions graph bends upward; the function predicts 134,947.08 million dollars in 2009
B : the functions graph bends downward; the function predicts 134,947.08 million dollars in 2009
C : the functions graph bends upward; the function predicts 68,279.14 million dollars in 2009
D : the functions graph bends downward; the function predicts 1,611.20 million dollars in 2009
E : the functions graph bends upward; the function predicts 1,611.20 million dollars in 2009

Correct Answer : D

93 : Suppose that the cost C (in dollars) of removing p percent of the particulate pollution from the smokestacks of an industrial plant is estimated by . What is the domain of this function? What will it cost to remove 99.0% of the particulate pollution? Round your answer to the nearest cent. $C(p) = \dfrac{7{,}450p}{100 - p}$

cost: $737,550.00
A : domain: cost: $737,550.00
C : domain: all p except p = 100cost: $737,550.00
B : domain: cost: $74.49
E : domain: all p except p = 100cost: $74.49

Correct Answer : B
D : domain:
94 : The monthly charge for water in a small town is given by , where x is water usage in hundreds of gallons and f (x) is cost in dollars. Find the monthly charge for 1900 gallons and for 2600 gallons. Round your answers to the nearest cent. $f(x) = \begin{cases} 36.00 & \text{if } 0 \le x \le 20 \\ 36.00 + 0.4(x - 20) & \text{if } x > 20 \end{cases}$

A : charge for 1900 gallons is $36.00charge for 2600 gallons is $38.40
B : charge for 1900 gallons is $788.00charge for 2600 gallons is $1068.00
C : charge for 1900 gallons is $36.00charge for 2600 gallons is $46.40
D : charge for 1900 gallons is $38.40charge for 2600 gallons is $46.40
E : charge for 1900 gallons is $36.00charge for 2600 gallons is $74.40

Correct Answer : A

95 : A shipping companys charges for delivery of a package is a function of the packages weight. The following table describes the companys shipping rates.

Weight Increment	
First pound or fraction of a pound	
Each additional pound or fraction of a po	

Convert this table to a piecewise defined function that represents shipping costs for packages weighing between 0 and 4 pounds using x as the weight in pounds and C as the cost in dollars. Find the postage for a 0.75-pound package. Round your answer to the nearest cent.

cost for a 0.75 lb package: $0.45
cost for a 0.75 lb package: $0.23
cost for a 0.75 lb package: $1.09
cost for a 0.75 lb package: $0.45

E :

cost for a 0.75 lb package: $0.45

Correct Answer : D

96 : $p = \frac{800}{10+0.05x}$ The demand function for a product is given by , where x is the number of units and p is the price in dollars. Graph this demand function for , with x on the horizontal axis.

A :

B :

Correct Answer : C

97 : $p = \frac{900}{9+0.05x}$ The demand function for a product is given by , where x is the number of units and p is the price in dollars. The graph of this demand function for , with x on the horizontal axis is given below. Does the demand function ever reach 0?

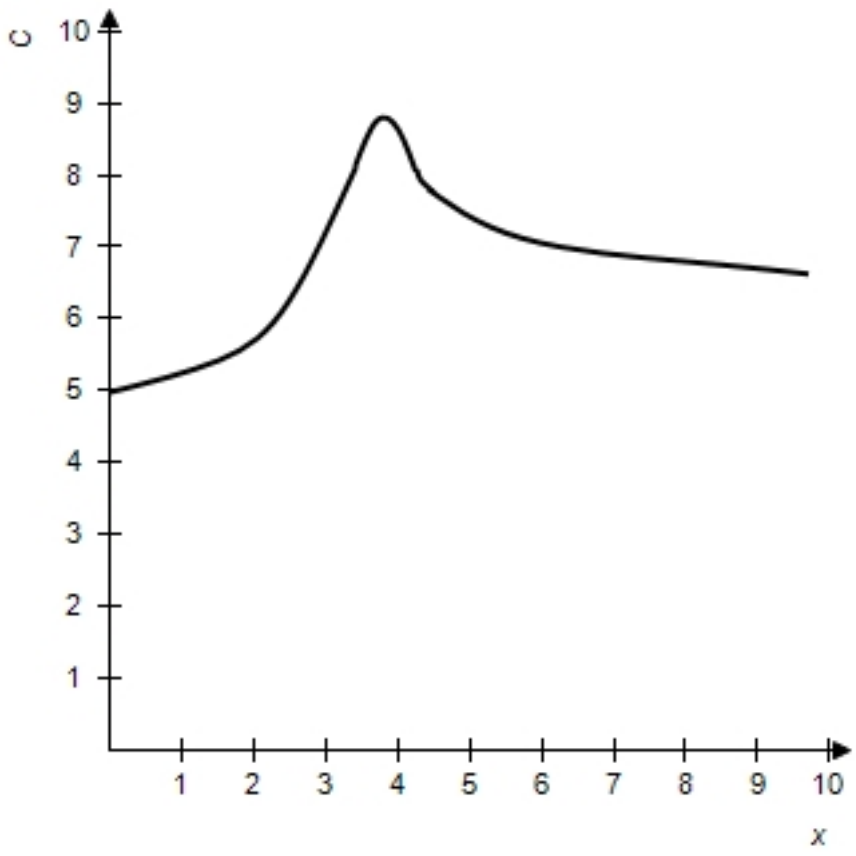
E :

A : Yes

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B : No

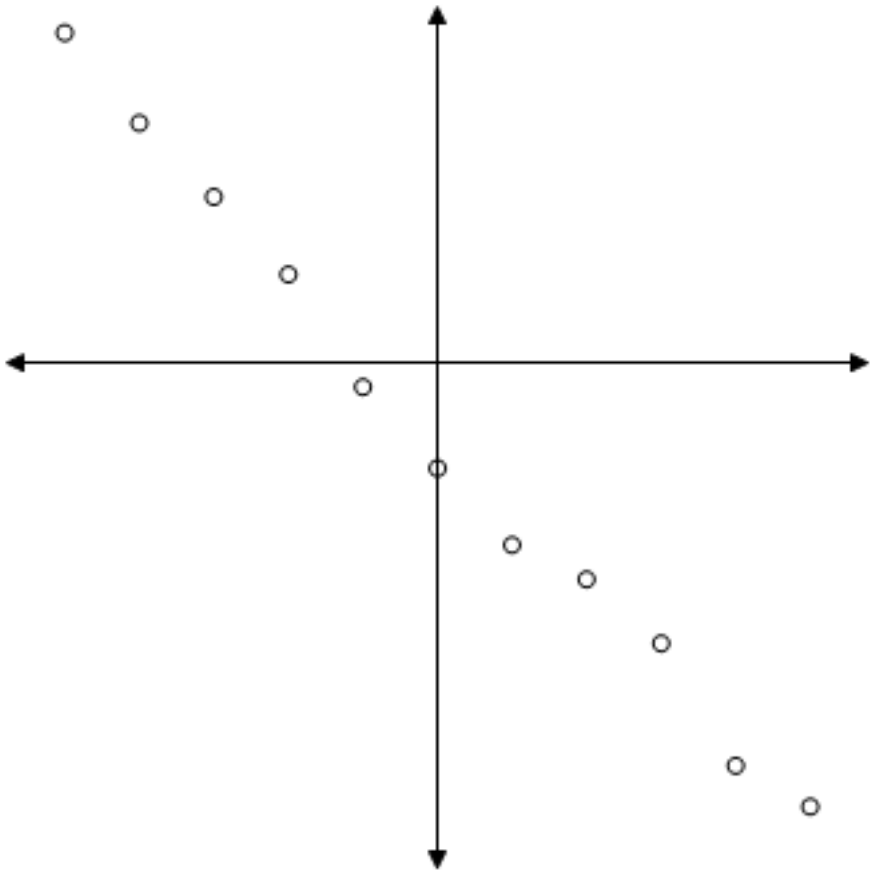
Correct Answer : B

98 : 

The given graph shows the cost C, in thousands of dollars, of a production run for a product when x machines are used. Estimate the companys fixed cost of production to the nearest thousand dollars, and determine the number of machines that will result in maximum cost for the company.
A : fixed production cost: $6,000maximum cost when 4 machines used
B : fixed production cost: $9,000maximum cost when 4 machines used
C : fixed production cost: $5,000maximum cost when 4 machines used
D : fixed production cost: $6,000maximum cost when 6 machines used
E : fixed production cost: $5,000maximum cost when 6 machines used

Correct Answer : C

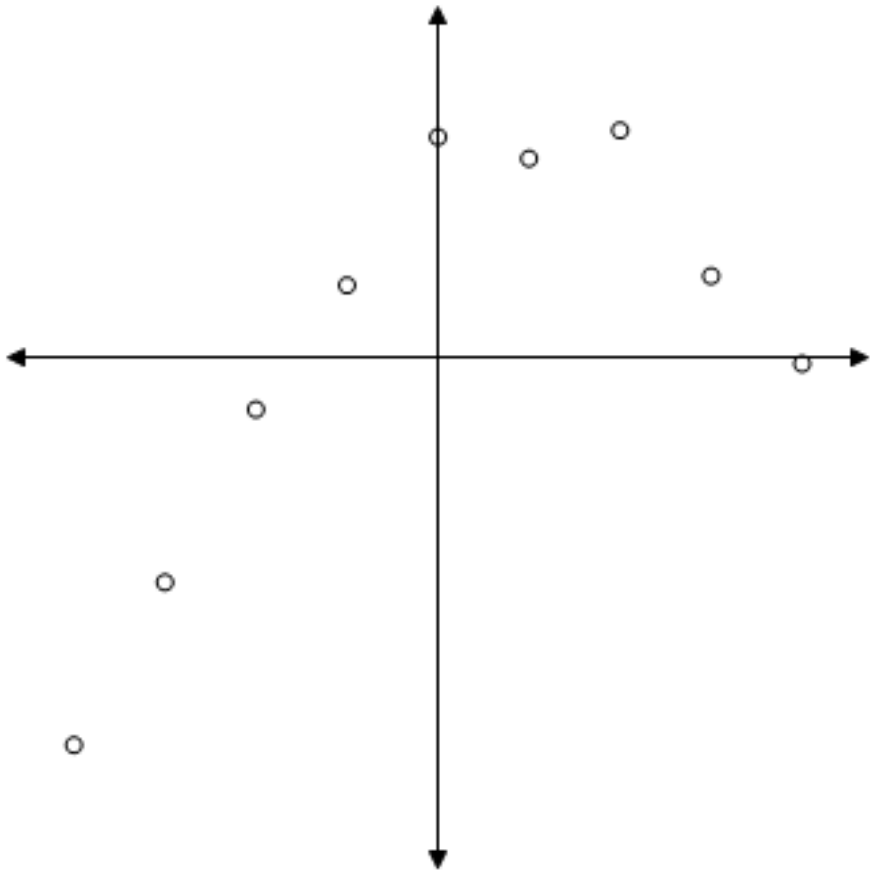
99 :



Determine whether the scatter plot should be modeled by a linear, power, quadratic, cubic, or quartic function.
A : linear
B : power
C : quadratic
D : cubic
E : quartic

Correct Answer : A

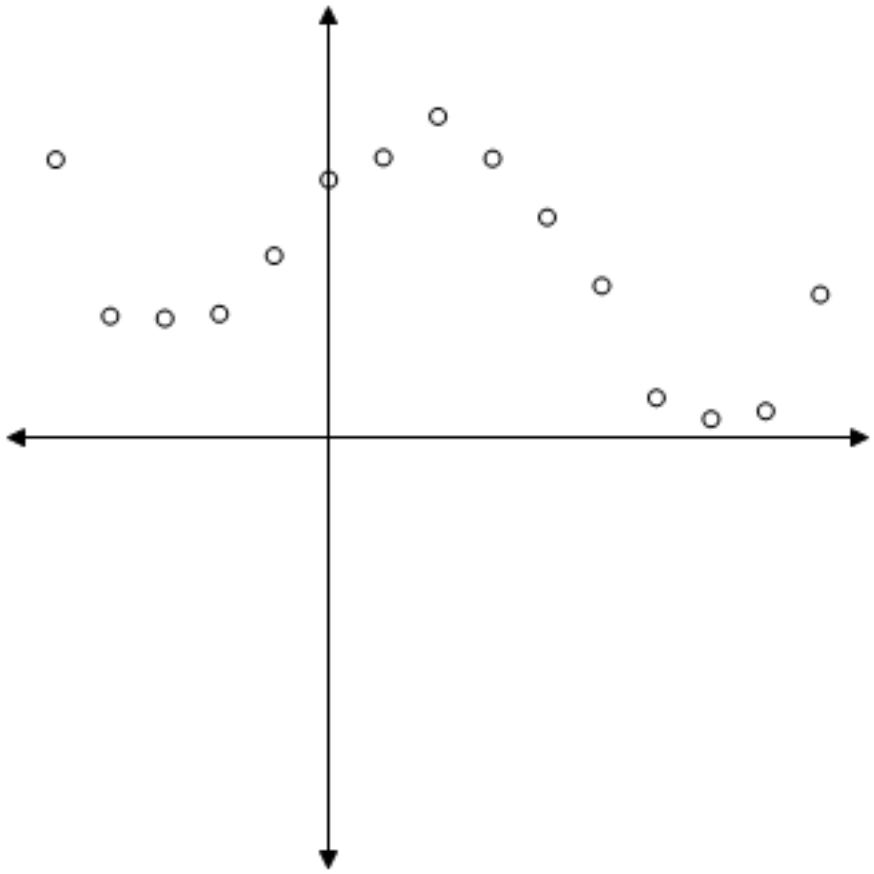
100 :



Determine whether the scatter plot should be modeled by a linear, power, quadratic, cubic, or quartic function.
A : linear
B : power
C : quadratic
D : cubic
E : quartic

Correct Answer : C

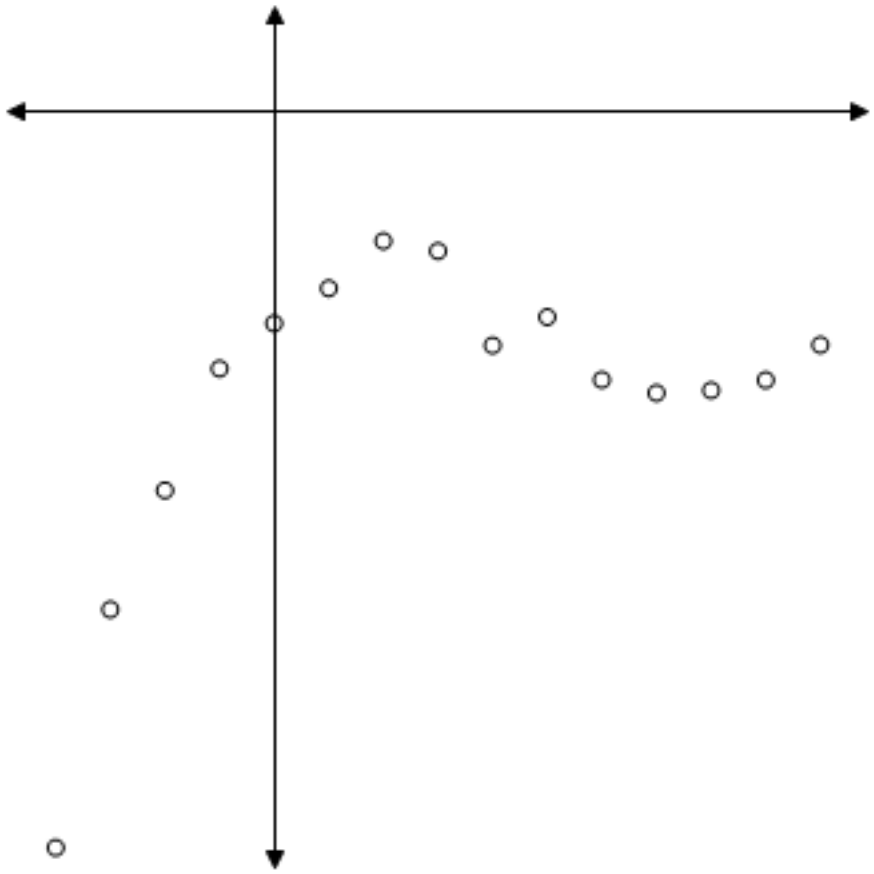
101 :



Determine whether the scatter plot should be modeled by a linear, power, quadratic, cubic, or quartic function.
A : linear
B : power
C : quadratic
D : cubic
E : quartic

Correct Answer : E

102 :



Determine whether the scatter plot should be modeled by a linear, power, quadratic, cubic, or quartic function.
A : linear
B : power
C : quadratic
D : cubic
E : quartic

Correct Answer : D

103 : Find the equation of the linear function that is the best fit for the given data. Round your final values to two decimal places.

x	y
0	3.5
1	5.6
2	7.1
3	9.6
4	11.5

Correct Answer : B

104 : Graph the linear function that models the data given in the table below.

x	1	0
y	1.5	1.0

A :

B :

C :

Correct Answer : A

105 : Find the equation of the quadratic function that is the best fit for the given data. Round your final values to two decimal places.

x	y
2	7.03
1	2.25
0	0.31
1	0.65
2	0.43
3	3.63
4	9.15

Correct Answer : E

106 : Graph the quadratic function that models the data given in the table below.

x	4

y 8

A :

B :

C :

Correct Answer : B

107 : Find the equation of the cubic function that is the best fit for the given data. Round your final values to two decimal places.

x	y
4	127.9
3	58.1
2	19.1
1	1.8
0	3.2
1	4.3
2	11.0

Correct Answer : B

108 : Graph the cubic function that models the data given in the table below. x 3 2

y 14 2

A :

B :

C :

Correct Answer : C

109 : Find the equation of the quartic function that is the best fit for the given data. Round your final values to two decimal places.

x	y
1	4.2
2	4.3
3	34.1
4	97.7
5	210.0
6	385.9
7	642.8

Correct Answer : A

110 : Graph the power function that models the data given in the table below. x 1 2

y	3.0000	8

A :

B :

C :

Correct Answer : B

E1:1 : Determine what type of function best models the data given below, and find the equation that is the best fit for the data. Round your final values to four decimal places.

x	y
0	1.50
1	7.33
2	13.41
3	19.32
4	25.33
5	31.44
6	37.37

Correct Answer : A

112 : Determine what type of function best models the data given below, and find the equation

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that is the best fit for the data. Round your final values to four decimal places.

x	y
0	7.8
1	40.1
2	59.7
3	66.3
4	59.7
5	40.4
6	7.7

A : linear;

B : quadratic;

C : power;

Correct Answer : B

E13. This table shows the average earnings of year-round, full-time workers by gender and educational attainment in a certain country. Let x represent earnings for males and y represent earnings for females, and find a linear model that expresses womens annual earnings as a function of mens. Interpret the slope of the linear model. Round your final values to three decimal places.

Educational Attainment	Average Annual Earnings
	Males
Less than 9th grade	$12,035
Some high school	$13,010
High school graduate	$18,085
Some college	$20,135
Associates degree	$26,295
Bachelors degree or more	$45,070

slope: females earn $1,292 for each $1,000 males earn
slope: the average difference in yearly male and female earnings is $1,292
slope: females earn $748 for each $1,000 males earn
slope: the average difference in yearly male and female earnings is $748
slope: the average of male and female earnings increases by an average of $748 for each level of educational attainment

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Correct Answer : C

114 : The table gives the median household income (in 2005 year) for two cities in various years. Let x represent the median household income for citizens of city A and y represent the corresponding median household income for citizens of city B. Find a linear model that expresses the median household income for citizens in city B as a function of the median household income for citizens of city B. Interpret the slope of the linear model. Round numerical values in your answer to three decimal places.

Median Household Income(2005 year)

Year	City A	City B
1985	$21,900	$19,600
1990	$23,800	$21,500
1995	$25,700	$24,500
2000	$27,400	$27,200
2005	$31,000	$31,100

A :

slope: median household income is growing at the same rate for city A as it is for city B.
slope: median household income is growing at the same rate for city A as it is for city B.
B : slope: median household income is growing at the same rate for city A as it is for city B.
slope: median household income is growing faster for city A than it is for city B.
C : slope: median household income is growing slower for city A than it is for city B.

Correct Answer : D

115 : The table gives the median household income (in 2005 year) for two cities in various years. Let x represent the median household income for citizens of city A and y represent the corresponding median household income for citizens of city B. Find a linear model that expresses the median household income for citizens in city B as a function of the median household income for citizens of city B. Interpret the slope of the linear model. Round numerical values in your answer to three decimal places.

Median Household Income(2005 year)

Year	City A	City B
1985	$21,900	$19,600
1990	$23,800	$21,500
1995	$25,700	$24,500
2000	$27,400	$27,200
2005	$31,000	$31,100

The model predicts that the maximum number of people have an IQ score of approximately 94.

The model predicts that the maximum number of people have an IQ score of approximately

90.
C :

The model predicts that the maximum number of people have an IQ score of approximately 90.

The model predicts that the maximum number of people have an IQ score of approximately 94.

D : The model predicts that the maximum number of people have an IQ score of approximately 90.

Correct Answer : A

E :

116 : $x = 0$ Suppose that the following table gives the number of near-collisions on the runways of the nations airports. With representing 1990, find a quadratic function that models the data in the chart. Round numerical values in your answer to four decimal places. Depending on the technology you use, your answer may be slightly different than the correct answer shown. Year

1990

1991

1992

1993

1994

1995

1996

1997

1998

1999

2000

A :

B :

C :

Correct Answer : A

E1:7 : Suppose that the following table gives the number of near-collisions on the runways of the nations airports. With representing 1990, find a quadratic function that models the data in the chart. Round numerical values in your answer to four decimal places. Depending on the technology you use, your answer may be slightly different than the correct answer shown.

Year
1990
1991
1992
1993
1994

1995
1996
1997
1998
1999
2000

A :

The model predicts that the population will not be greater than 1,400.
The model predicts that the population will not be greater than 1,400.
B : The model predicts that the population will be greater than 1,400.
The model predicts that the population will be greater than 1,400.
C : The model predicts that the population will not be greater than 1,400.

Correct Answer : B

E18 : Suppose that the following table shows the number of millions of people in the United States who lived below the poverty level for selected years. Find a cubic model that approximately fits the data, using x as the number of years after 1960. Round numerical values in your answer to four decimal places. Depending on the technology you use, your answer may be slightly different than the correct answer shown.

Year	Persons Living Below thePoverty Leve
1960	87.3
1970	28.4
1975	25.6
1980	43.2

1989	97.6
1990	103.9
1992	100.8
1996	120.4
2000	140.6
2002	138.4

A :

B :

C :

Correct Answer : D

E19 : The table below shows the national expenditures for health care in a certain country for selected years. Find a power model and a linear model for the data where x is the number of years after 1950. Which of the models seems to be the best to use if you are interested in finding the health care costs near the year 1990? Round numerical values in your answers to three decimal places.

Year	National Expenditures for Health Care (in billions)
1960	$20.3
1970	$71.0
1980	$249.3

1990	$693.3
2000	$1,423.1

A :

The power model gives more accurate results near the year 1990.
The linear model gives more accurate results near the year 1990.

B : The power model gives more accurate results near the year 1990.
The linear model gives more accurate results near the year 1990.

C : The power model gives more accurate results near the year 1990.

Correct Answer : A

E20 : Suppose the following table gives the U.S. population, in millions, for selected years, with projections to 2050. Find a linear model that approximately fits the data, with x equal to the number of years past 1960. Round numerical values in your answer to three decimal places. Depending on the technology you use, your answer may be slightly different than the correct answer shown.

Year	1960	1970	1980	1990
U. S. Populations (millions)	178.671	217.758	230.762	249.948

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D :

E :
Correct Answer : A

121 : Suppose the following table gives the U.S. population, in millions, for selected years, with projections to 2050. Find a linear model that approximately fits the data, with x equal to the number of years past 1960. Round numerical values in your answer to three decimal places. Depending on the technology you use, your answer may be slightly different than the correct answer shown.

Year	1960	1970	1980	1990
U. S. Populations (millions)	178.671	217.758	230.762	249.948

foreign born population will be 100% in 1965.
foreign born population will be 100% in 1975.
foreign born population will be 100% in 1975.
foreign born population will be 100% in 1965.
foreign born population will be 100% in 1985.

Correct Answer : C