Intermediate Algebra with Applications and Visualization 5th edition Rockswold Test Bank

SKU: 9780134442327-TEST-BANK

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate f(x) at the given value of x.

1) $f(x) = 3x - 3;\ x = -3$

A) –10 B) 11 C) 12 D) –12

Answer: D

2) $f(x) = \sqrt{x};\ x = \frac{4}{25}$

A) $\frac{5}{2}$ B) $\frac{2}{5}$ C) $\frac{4}{25}$ D) $\frac{2}{25}$

Answer: B

3) $f(x) = x^2 + 3;\ x = 9$

A) 80 B) 86 C) 81 D) 84

Answer: D

4) $f(x) = \frac{x}{x+3};\ x = -11$

A) $\frac{1}{3}$ B) $\frac{11}{8}$ C) $\frac{1}{4}$ D) $-\frac{11}{8}$

Answer: B

Write a formula for the function described.

5) Function C computes the number of centimeters in x inches. (Hint: there are 2.54 centimeters in one inch.)

A) $C(x) = \frac{2.54}{x}$ B) $C(x) = x - 2.54$ C) $C(x) = \frac{x}{2.54}$ D) $C(x) = 2.54x$

Answer: D

6) Function I computes the number of inches in x centimeters. (Hint: there are 2.54 centimeters in one inch.)

A) $I(x) = \frac{2.54}{x}$ B) $I(x) = 2.54x$ C) $I(x) = 2.54 - x$ D) $I(x) = \frac{x}{2.54}$

Answer: D

7) Function F computes the number of square feet in x square yards.

A) $F(x) = 9x$ B) $F(x) = 9 - x$ C) $F(x) = \frac{9}{x}$ D) $F(x) = \frac{x}{9}$

Answer: A

8) Function Y computes the number of square yards in x square feet.

A) $fY(x) = \frac{9}{x}$ B) $Y(x) = x - 9$ C) $Y(x) = \frac{x}{9}$ D) $Y(x) = 9x$

Answer: C

9) Surveyors use the "link" as a unit of measure. Function i computes the number of inches in x links. (Hint: there are 7.92 inches in one link.)

A) $i(x) = x + 7.92$ B) $i(x) = 7.92x$ C) $i(x) = \frac{7.92}{x}$ D) $i(x) = \frac{x}{7.92}$

Answer: B

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10) Surveyors use the "link" as a unit of measure. Function l computes the number of links in x inches. (Hint: there are 7.92 inches in one link.)

A) $l(x) = \frac{7.92}{x}$ B) $l(x) = 7.92x$ C) $l(x) = 7.92 - x$ D) $l(x) = \frac{x}{7.92}$

Answer: D

11) Bob buys a car that gets 10 miles per gallon of gasoline. Function M computes the number of miles that Bob can travel with x gallons of gasoline.

A) $M(x) = \frac{10}{x}$ B) $M(x) = x + 10$ C) $M(x) = 10x$ D) $M(x) = \frac{x}{10}$

Answer: C

Write the function f as a set of ordered pairs. Give the domain and range of f.

12) f(−4) = −3, f(0) = 4, f(7) = 8, f(10) = 6

A) f = {(−4, −3), (0, 4), (7, 8), (10, 6)}; D = {−4, 0, 7, 10}; R = {−3, 4, 6, 8}
B) f = {(−3, −4), (4, 0), (8, 7), (6, 10)}; D = {−4, 0, 7, 10}; R = {−3, 4, 6, 8}
C) f = {(−4, −3), (0, 4), (7, 8), (10, 6)}; D = {−3, 4, 6, 8}; R = {−4, 0, 7, 10}
D) f = {(−3, −4), (4, 0), (8, 7), (6, 10)}; D = {−3, 4, 6, 8}; R = {−4, 0, 7, 10}

Answer: A

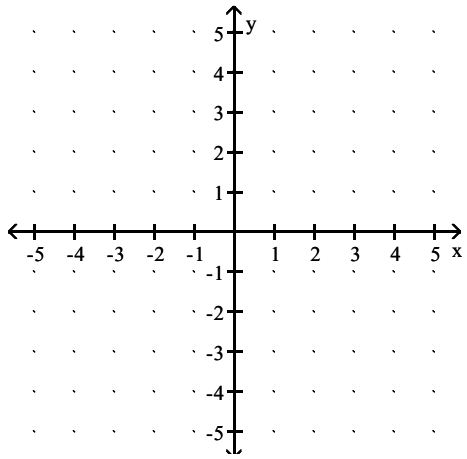
13) f(f) = −6, f(g) = −6, f(h) = −6, f(i) = −6

A) f = {(−6, f), (−6, g), (−6, h), (−6, i)}; D = {−6}; R = {f, g, h, i}
B) f = {(−6, f), (−6, g), (−6, h), (−6, i)}; D = {f, g, h, i}; R = {−6}
C) f = {(f, −6), (g, −6), (h, −6), (i, −6)}; D = {f, g, h, i}; R = {−6}
D) f = {(f, −6), (g, −6), (h, −6), (i, −6)}; D = {−6}; R = {f, g, h, i}

Answer: C

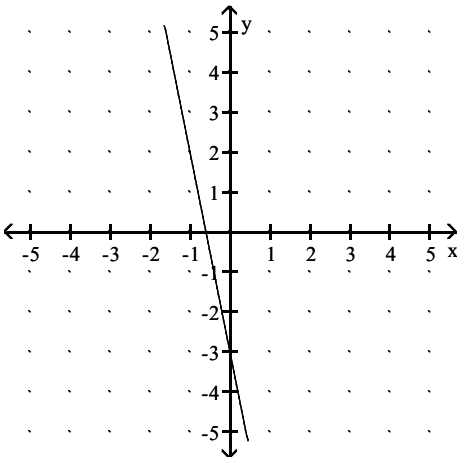
Sketch the graph of f by hand.

14) f(x) = −5x + 3

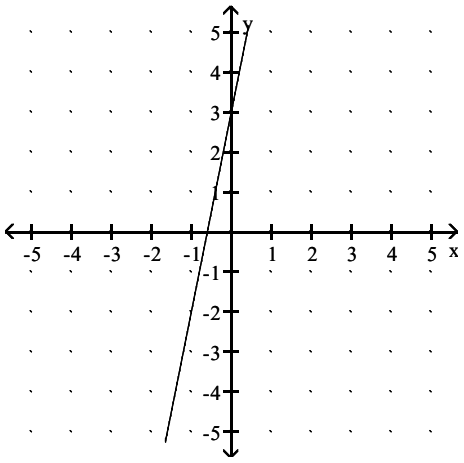


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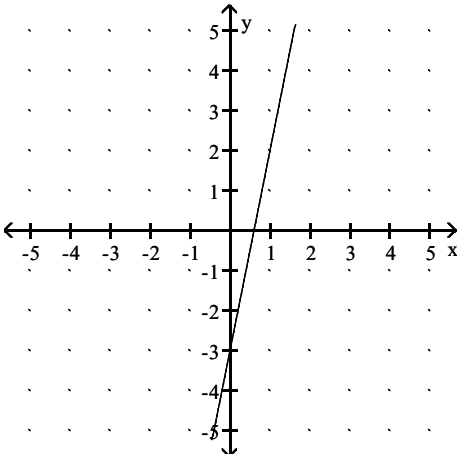
A)



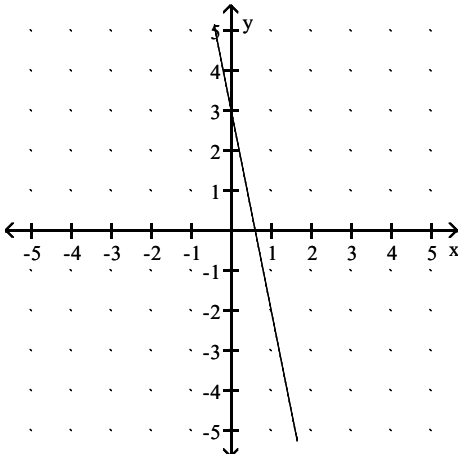
B)



C)

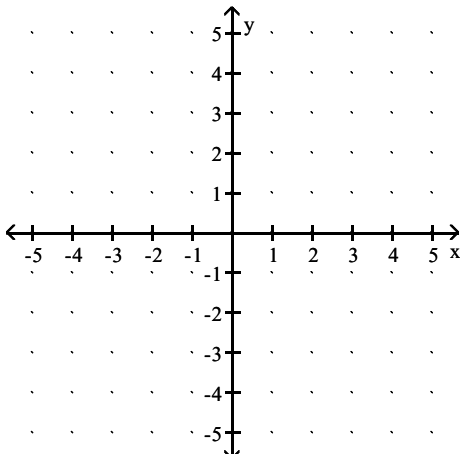


D)



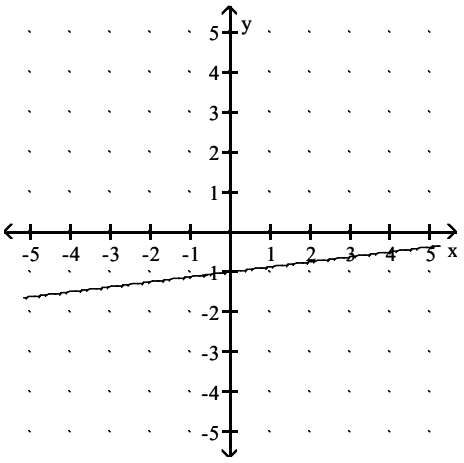
Answer: D

15) $f(x) = \frac{1}{4}x - 1$

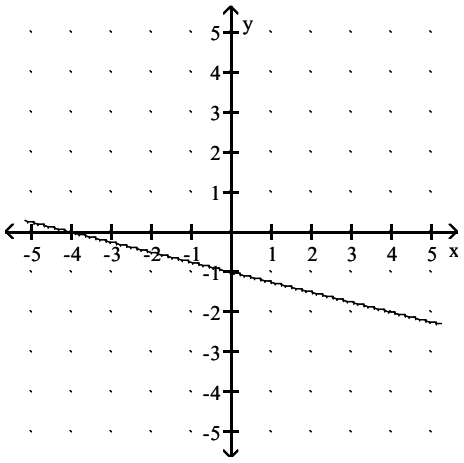


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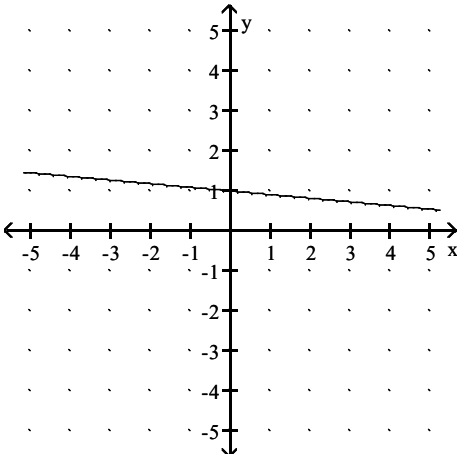
A)



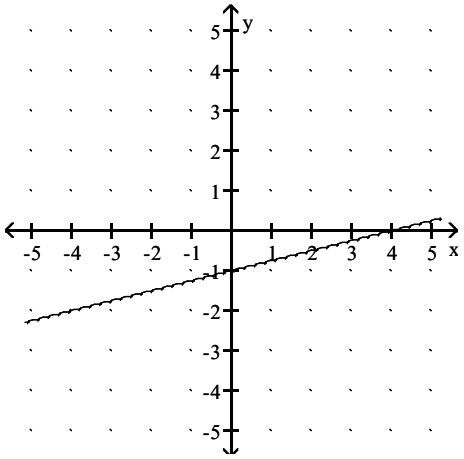
B)



C)

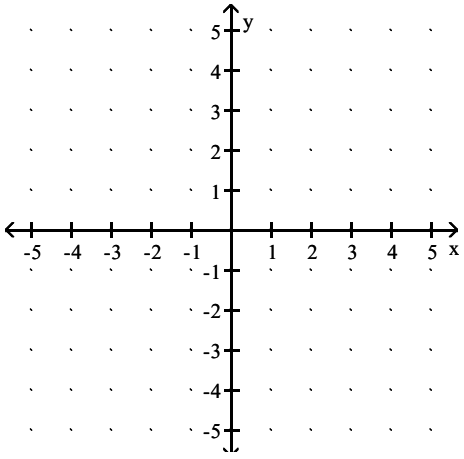


D)



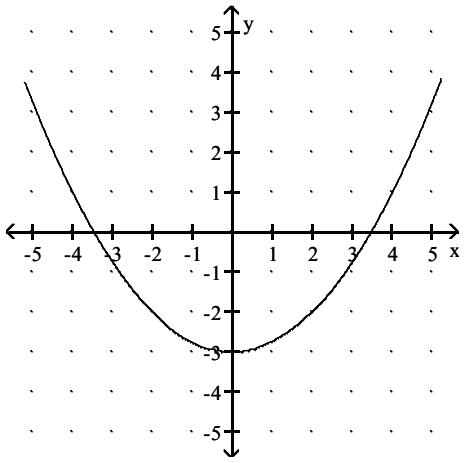
Answer: D

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

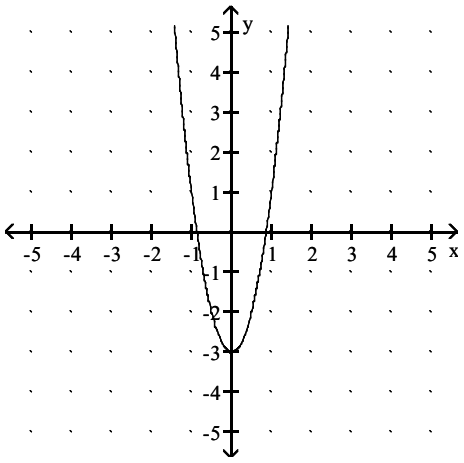


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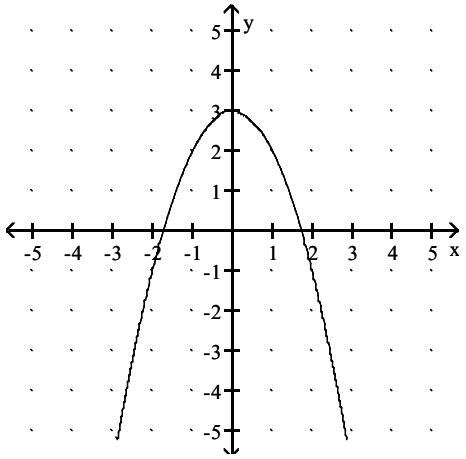
A)



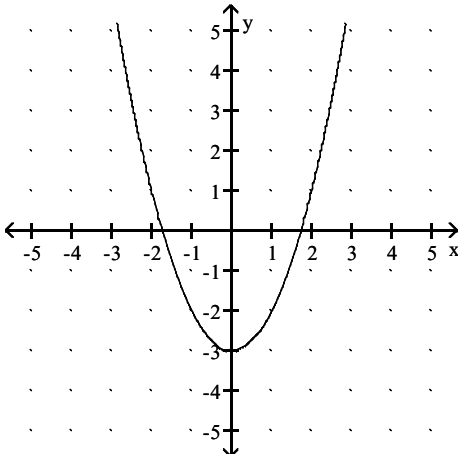
B)



C)

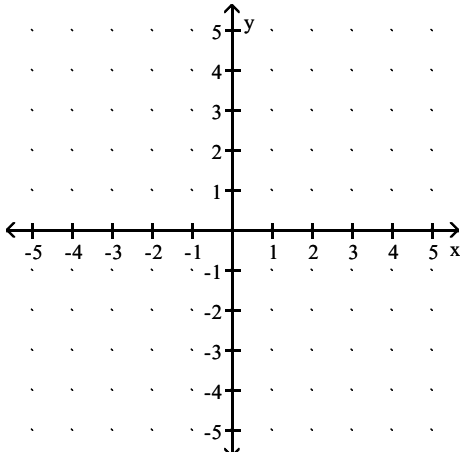


D)



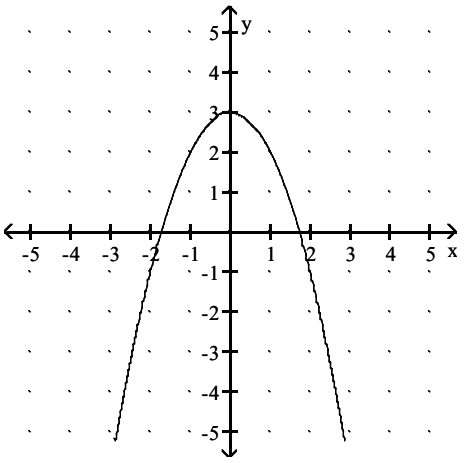
Answer: D

17) $f(x) = \sqrt{x + 3}$

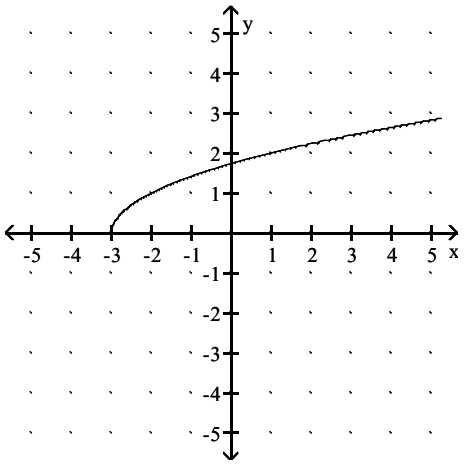


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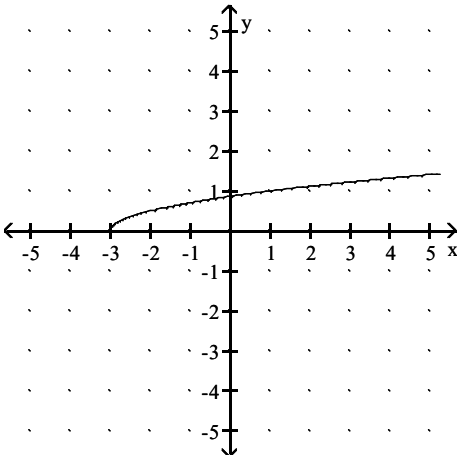
A)



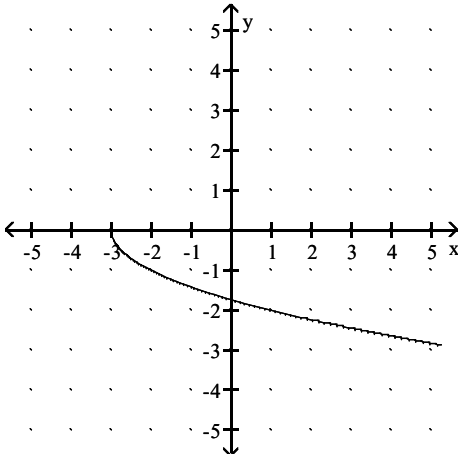
B)



C)



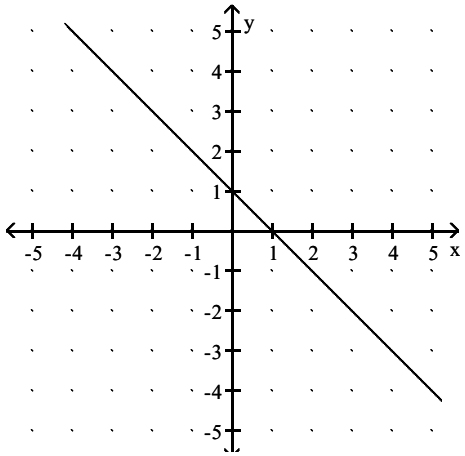
D)



Answer: B

Evaluate the function as indicated.

18) Find f(0) using the graph of f provided below.

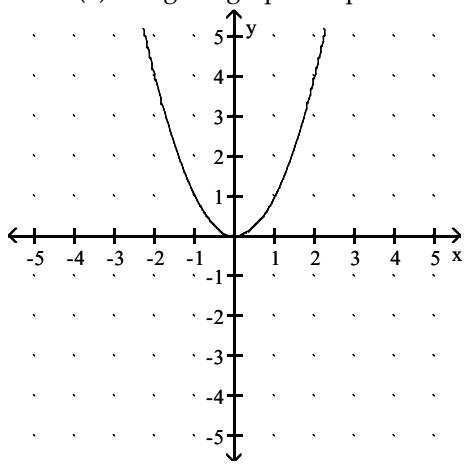


A) 0 B) 1 C) 2 D) 3

Answer: B

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19) Find f(0) using the graph of f provided below.



A) –2 B) –1 C) 1 D) 0

Answer: D

20) Find f(0) using the table provided below.

x	–20	–10	0	10	20
f(x)	37	47	57	67	77

A) 0 B) 67 C) 57 D) 47

Answer: C

21) Find f(–5) using the table provided below.

x	–10	–5	0	5	10
f(x)	92	17	–8	17	92

A) –17 B) 17 C) 5 D) –5

Answer: B

22) This chart shows the fees for an 18–hole round of golf for each of the last 5 years at a local municipal golf course. Assume that this chart defines a function with the name of f. Find f(2010).

Year	Fee
2008	$21
2009	$23
2010	$26
2011	$26
2012	$27

A) $27 B) $26 C) $21 D) $23

Answer: B

Express the verbal representation for the function f numerically.

23) Add 10 to the input x to obtain the output y. Let x = –3, –2, –1, 0, 1, 2, 3.

A)

x	–3	–2	–1	0	1	2	3
y	8	9	10	11	12	13	14

B)

x	–3	–2	–1	0	1	2	3
y	–13	–12	–11	10	–9	–8	–7

C)

x	–3	–2	–1	0	1	2	3
y	6	7	8	9	10	11	12

D)

x	–3	–2	–1	0	1	2	3
y	7	8	9	10	11	12	13

Answer: D

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24) Cube the input x to obtain the output y. Let x = –3, –2, –1, 0, 1, 2, 3.

A)

x	–3	–2	–1	0	1	2	3
y	3	2	1	0	1	2	3

B)

x	–3	–2	–1	0	1	2	3
y	9	4	1	0	1	4	9

C)

x	–3	–2	–1	0	1	2	3
y	–27	–8	–1	0	1	8	27

D)

x	–3	–2	–1	0	1	2	3
y	–6	–4	–2	0	2	4	6

Answer: C

25) Multiply the input x by 11 and then subtract 12 to obtain the output y. Let x = –3, –2, –1, 0, 1, 2, 3.

A)

x	– 3	–2	–1	0	1	2	3
y	21	10	–1	12	–23	–34	–45

B)

x	– 3	–2	–1	0	1	2	3
y	45	34	22	12	1	–10	–21

C)

x	– 3	–2	–1	0	1	2	3
y	–45	–34	–23	–12	–1	10	21

D)

x	– 3	–2	–1	0	1	2	3
y	–21	–10	1	12	22	34	45

Answer: C

26) Divide the input x by 2 and then add 4 to obtain the output y. Let x = –3, –2, –1, 0, 1, 2, 3.

A)

x	–3	–2	–1	0	1	2	3
y	$\frac{5}{2}$	3	$\frac{7}{2}$	4	$\frac{9}{2}$	5	$\frac{11}{2}$

B)

x	–3	–2	–1	0	1	2	3
y	$\frac{11}{2}$	5	$\frac{9}{2}$	4	$-\frac{7}{2}$	–3	$-\frac{5}{2}$

C)

x	–3	–2	–1	0	1	2	3
y	$\frac{11}{2}$	5	$\frac{9}{2}$	4	$\frac{7}{2}$	3	$\frac{5}{2}$

D)

x	–3	–2	–1	0	1	2	3
y	$-\frac{5}{2}$	–3	$-\frac{7}{2}$	4	$\frac{9}{2}$	5	$\frac{11}{2}$

Answer: A

Express the verbal representation for the function f symbolically.

27) Add 5 to the input x to obtain the output y.

A) $y = 5x$ B) $y = x + 5$ C) $y = x - 5$ D) $y = \frac{x}{5}$

Answer: B

28) Cube the input x to obtain the output y.

A) $y = x^3$ B) $y = 3^x$ C) $y = x - 3$ D) $y = 3x$

Answer: A

29) Multiply the input x by 15 and then subtract 2 to obtain the output y.

A) $y = 15x - 2$ B) $y = 15 - 2x$ C) $y = 13x$ D) $y = 2 - 15x$

Answer: A

30) Divide the input x by 2 and then add 3 to obtain the output y.

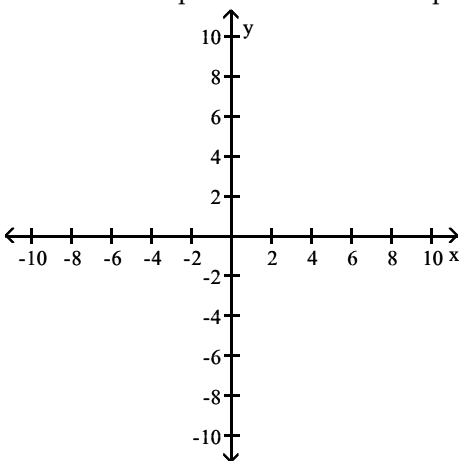
A) $y = 2x + 3$ B) $y = 2x - 3$ C) $y = \frac{x}{2} - 3$ D) $y = \frac{x}{2} + 3$

Answer: D

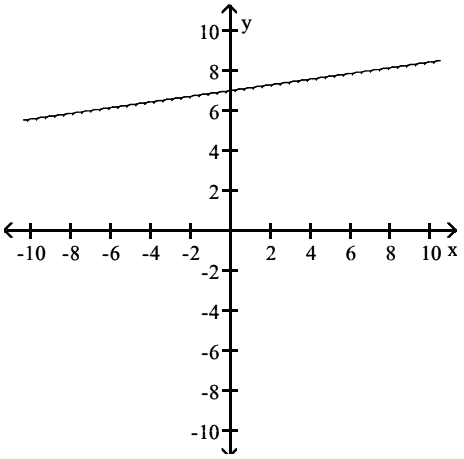
Express the verbal representation for the function f graphically.

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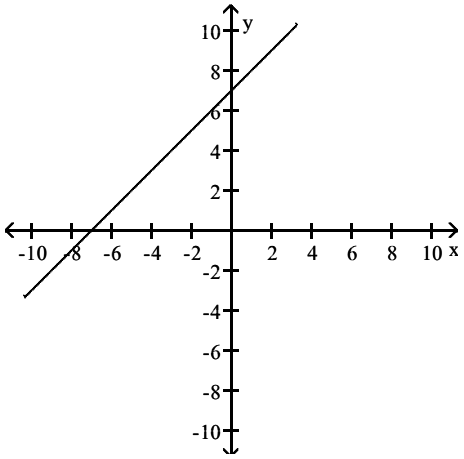
31) Add 7 to the input x to obtain the output y.



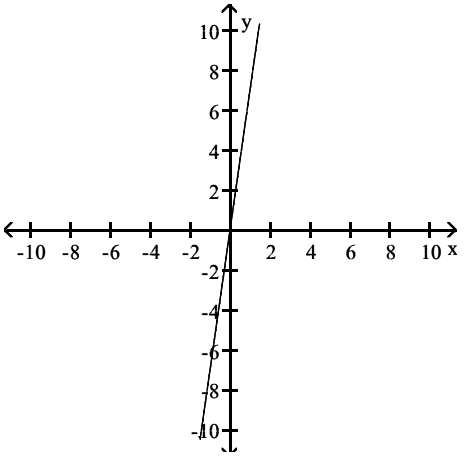
A)



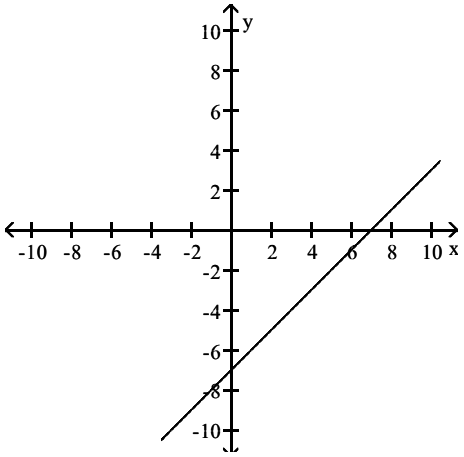
B)



C)



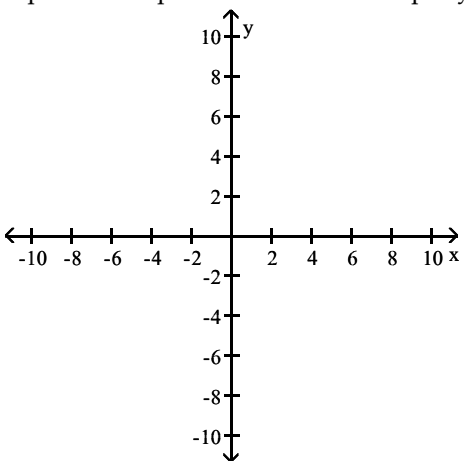
D)



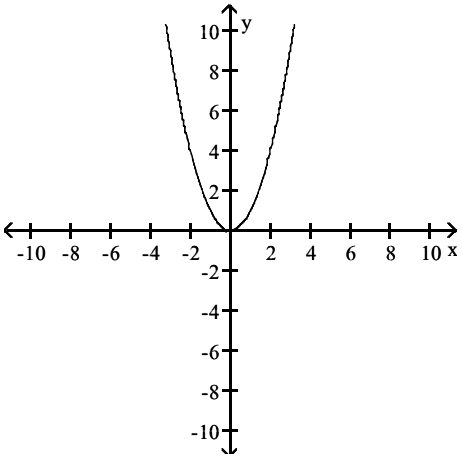
Answer: B

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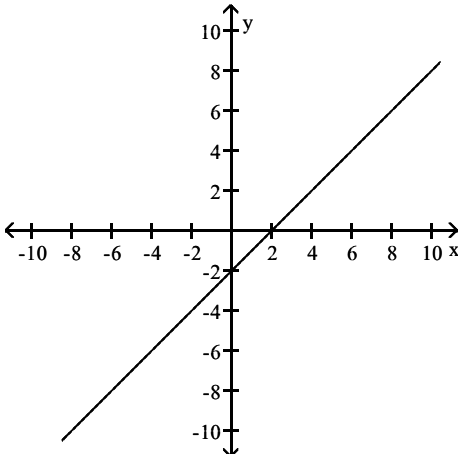
32) Square the input x to obtain the output y.



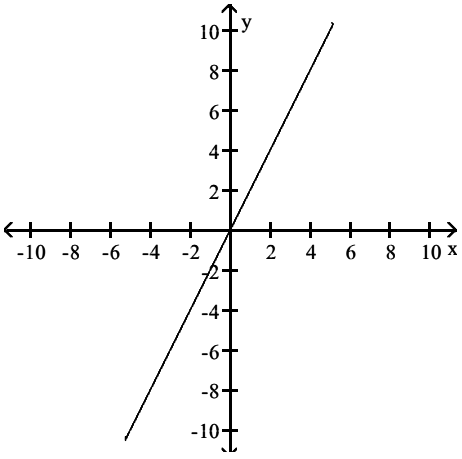
A)



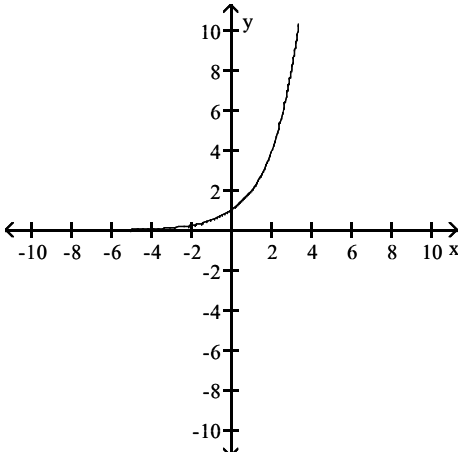
B)



C)



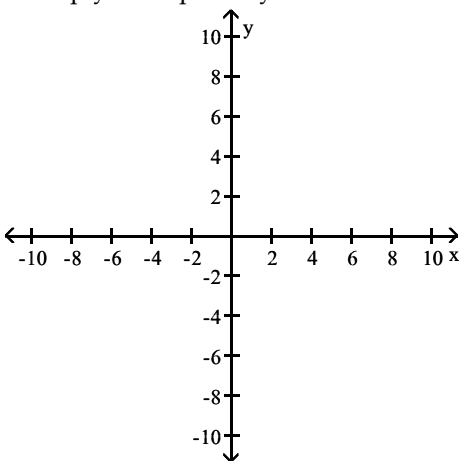
D)



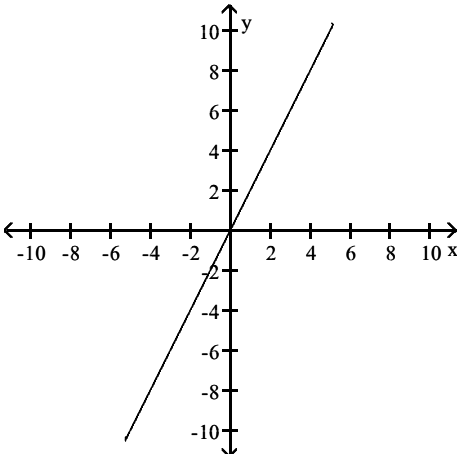
Answer: A

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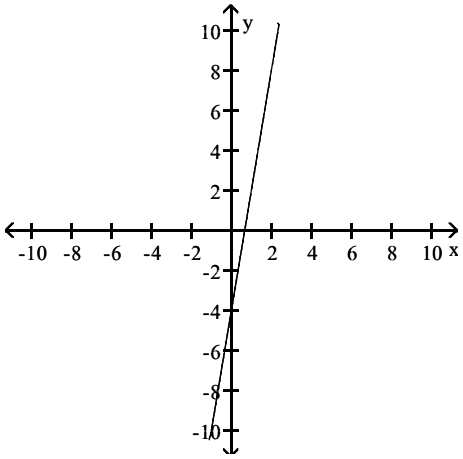
33) Multiply the input x by 6 and then subtract 4 to obtain the output y.



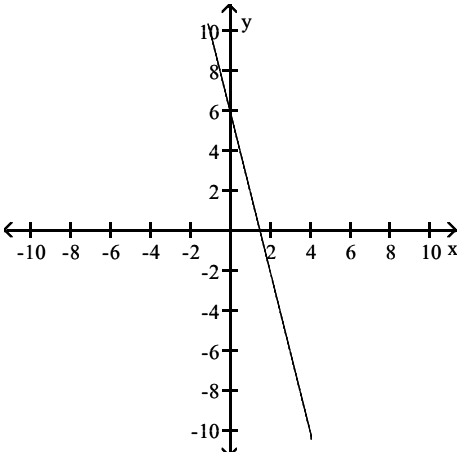
A)



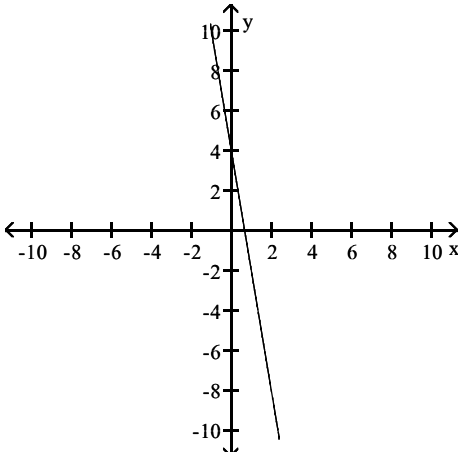
B)



C)



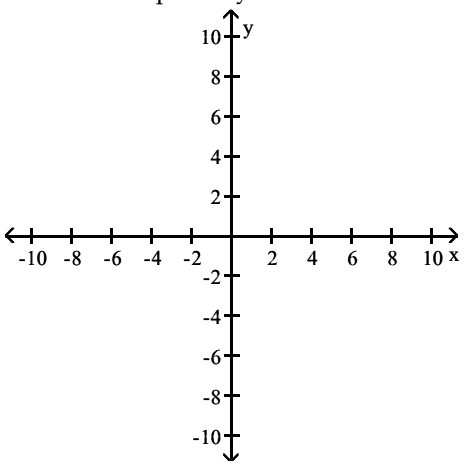
D)



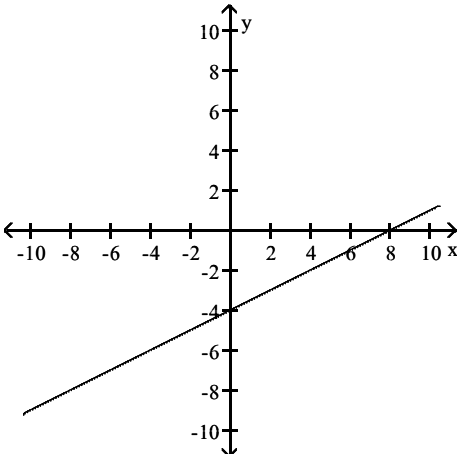
Answer: B

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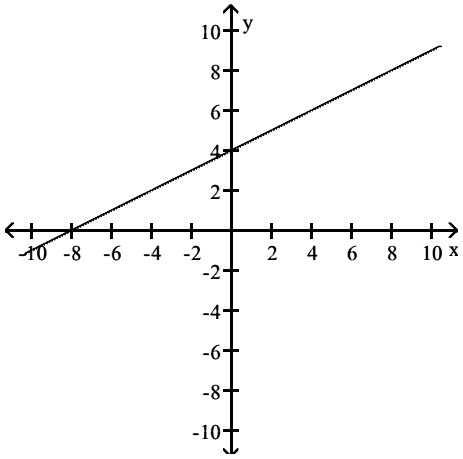
34) Divide the input x by 2 and then add 4 to obtain the output y.



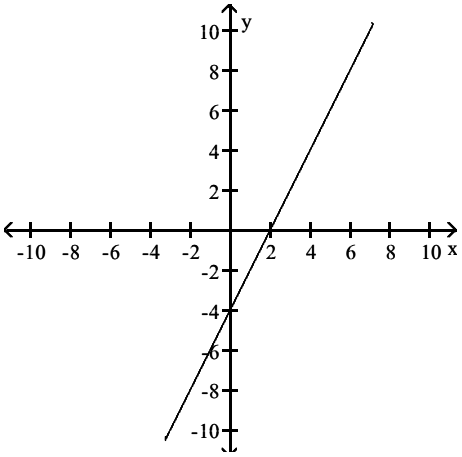
A)



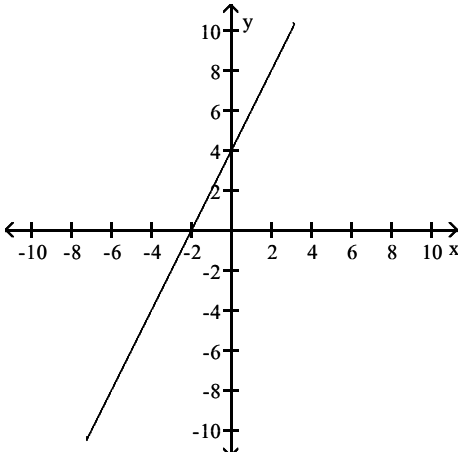
B)



C)



D)



Answer: B

Give a verbal representation of f(x).

35) f(x) = 3x

A) Subtract 3 from the input x to obtain the output y.

B) Divide the input x by 3 to obtain the output y.

C) Multiply the input x by 3 to obtain the output y.

D) Add 3 to the input x to obtain the output y.

Answer: C

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36) $f(x) = 2x - 1$

A) Divide the input x by 2 and then add 1 to obtain the output y.
B) Multiply the input x by 2 and then subtract 1 to obtain the output y.
C) Multiply the input x by 2 and then add 1 to obtain the output y.
D) Multiply the input x by 1 and then subtract 2 to obtain the output y.

Answer: B

37) $f(x) = 5x - \frac{1}{4}$

A) Divide the input x by 5 and then add $\frac{1}{4}$ to obtain the output y.

B) Divide the input x by 5 and then subtract $\frac{1}{4}$ to obtain the output y.

C) Multiply the input x by 5 and then add $\frac{1}{4}$ to obtain the output y.

D) Multiply the input x by 5 and then subtract $\frac{1}{4}$ to obtain the output y.

Answer: D

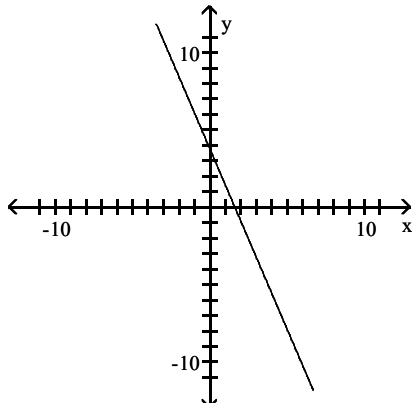
38) $f(x) = x^2 - 10$

A) Take the square root of the input x and then add 10 to obtain the output y.
B) Square the input x and then add 10 to obtain the output y.
C) Take the square root of the input x and then subtract 10 to obtain the output y.
D) Square the input x and then subtract 10 to obtain the output y.

Answer: D

Find the domain and the range of the function.

39)



A) D: $x \geq \frac{11}{7}$, R: $y \geq 0$

B) D: $x \geq 0$, R: $y \geq -\frac{11}{3}$

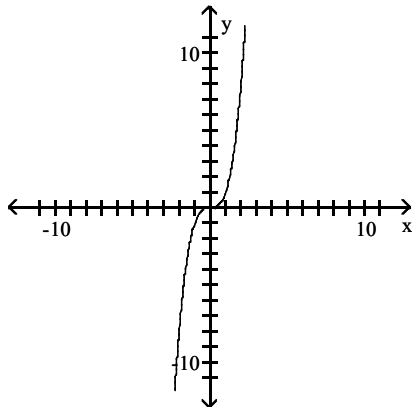
C) D: $x \leq \frac{11}{7}$, R: $y \leq 0$

D) D: All real numbers, R: All real numbers

Answer: D

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40)



A) D: $x \geq 0$, R: $y \geq 0$

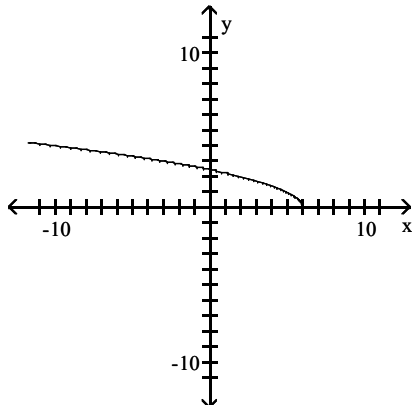
B) D: All real numbers, R: All real numbers

C) D: $x \leq 0$, R: $y \leq 0$

D) D: $x > 0$, R: $y > 0$

Answer: B

41)



A) D: All real numbers, R: $y \geq 0$

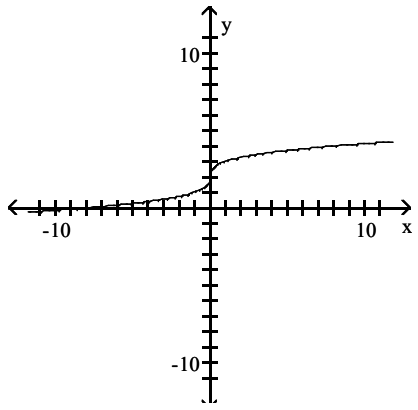
B) D: $x < \sqrt{6}$, R: $y \leq 0$

C) D: $x \leq 6$, R: $y \geq 0$

D) D: $x < 6$ or $x > 6$, R: $y < 0$ or $y > 0$

Answer: C

42)



A) D: $x > 0$, R: $y \geq 0$

B) D: All real numbers, R: All real numbers

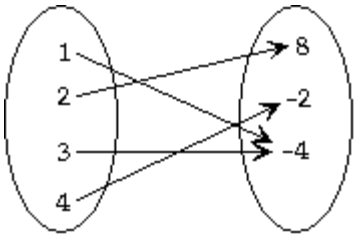
C) D: $x > 2$, R: $y \leq 0$

D) D: $x > 4$, R: $y \geq 0$

Answer: B

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Use the diagram to find the domain and range of f.

43) 

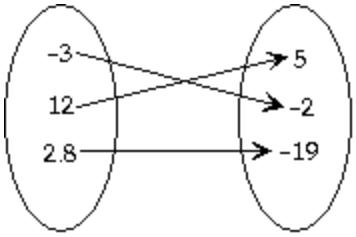
A) D = All real numbers
R = All real numbers

B) D = {1, 2, 3, 4}
R = {–4, –2, 8}

C) D = {1, 2, 3, 4}
R = {–4, –3, –2, –1, 0, 1, 2, 3, 4, 5, 6, 7, 8}

D) D = {–4, –2, 8}
R = {1, 2, 3, 4}

Answer: B

44) 

A) D = {–19, –2, 5}
R = {–3, 2.8, 12}

B) D = {–3, 2.8, 12}
R = {–19, –2, 5}

C) D = {–3, 12}
R = {–19, –2, 5}

D) D = All real numbers
R = All real numbers

Answer: B

Find the domain of the function.

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

A) $x > 0$ B) $x > 3$ C) $x \neq 0$ D) All real numbers

Answer: D

46) $f(x) = 5x^2 + 7x + 5$

A) $x > 0$ B) $x < 0$ C) All real numbers D) $x \neq 0$

Answer: C

47) $f(x) = \dfrac{x}{x - 4}$

A) $x < 0$ B) $x \neq 4$ C) $x \neq -4$ D) $x > 0$

Answer: B

48) $f(x) = \dfrac{(x + 4)(x - 4)}{x^2 + 16}$

A) $x > 16$ B) All real numbers C) $x \neq 16$ D) $x \neq -4$ and $x \neq 4$

Answer: B

49) $f(x) = |4x - 9|$

A) $x < \dfrac{9}{4}$ B) $x \neq \dfrac{9}{4}$ C) All real numbers D) $x > \dfrac{9}{4}$

Answer: C

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

A) All real numbers B) $x < 1$ C) $x \neq 0$ D) $x > 5$

Answer: C

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

A) $x > 3$ B) $x < 2$ C) $x \neq 0$ D) All real numbers

Answer: C

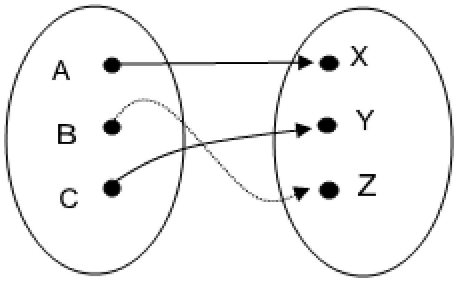
52) $f(x) = \frac{2}{x + 9}$

A) $x < 9$ B) All real numbers C) $x \neq 0$ D) $x \neq -9$

Answer: D

Determine whether the diagram could represent a function.

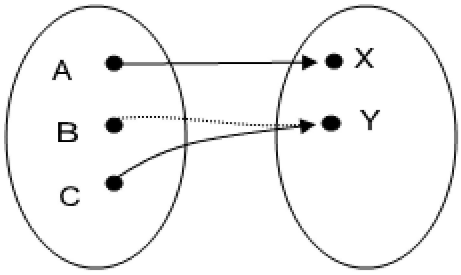
53)



A) Yes B) No

Answer: A

54)

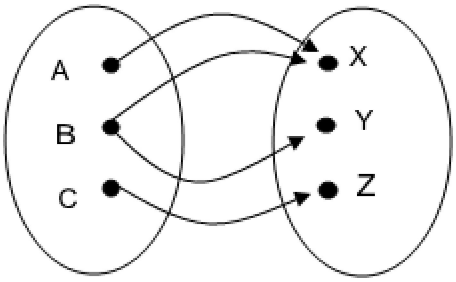


A) Yes B) No

Answer: A

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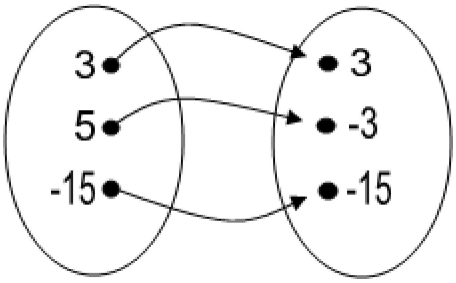
55)



A) Yes B) No

Answer: B

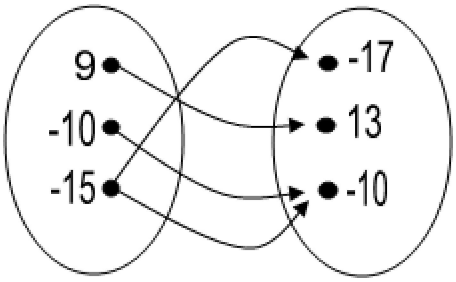
56)



A) Yes B) No

Answer: A

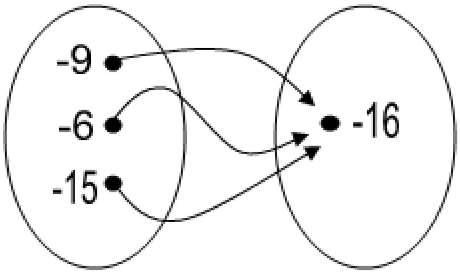
57)



A) Yes B) No

Answer: B

58)

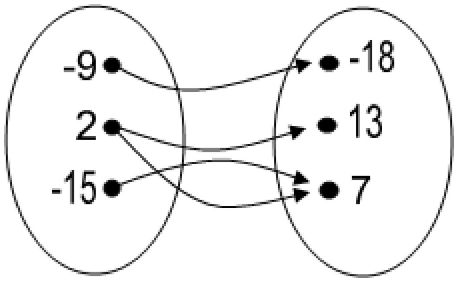


A) Yes B) No

Answer: A

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59)

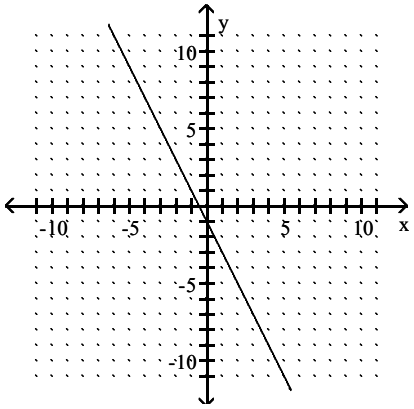


A) Yes B) No

Answer: B

Determine whether the graph represents a function.

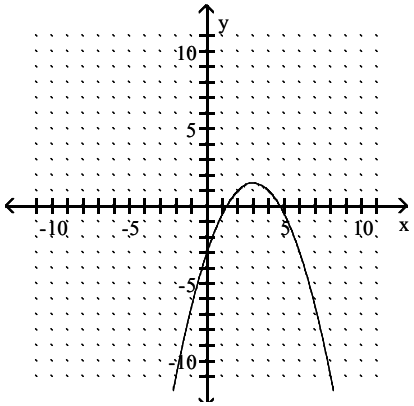
60)



A) Yes B) No

Answer: A

61)

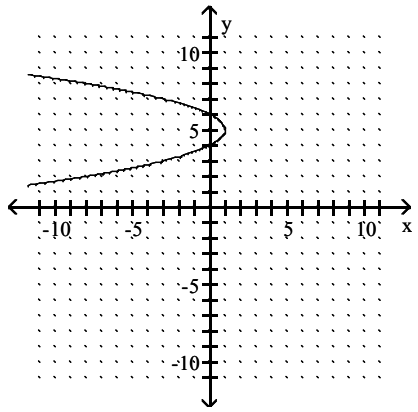


A) Yes B) No

Answer: A

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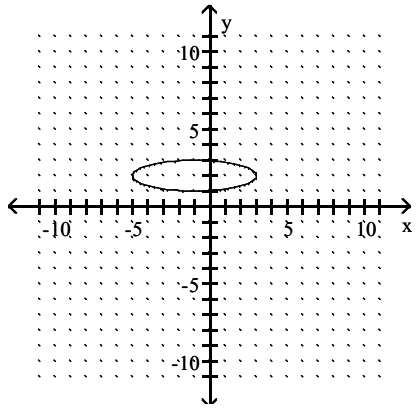
62)



A) Yes B) No

Answer: B

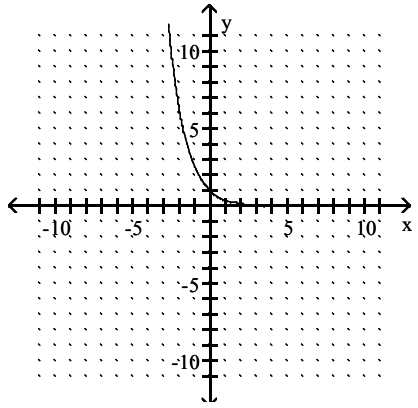
63)



A) Yes B) No

Answer: B

64)

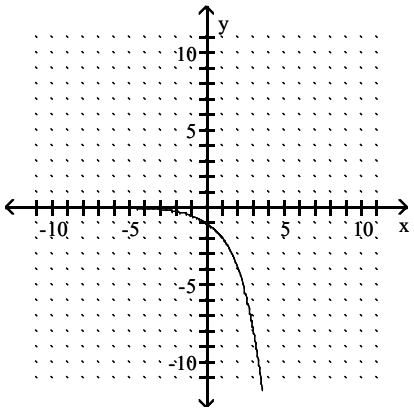


A) No B) Yes

Answer: B

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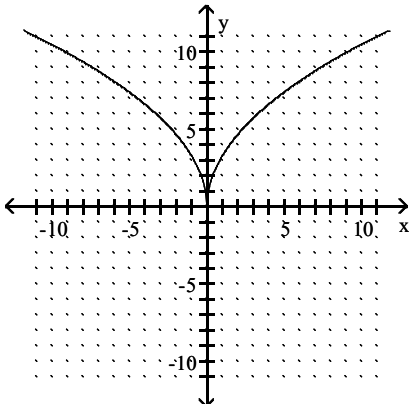
65)



A) Yes B) No

Answer: A

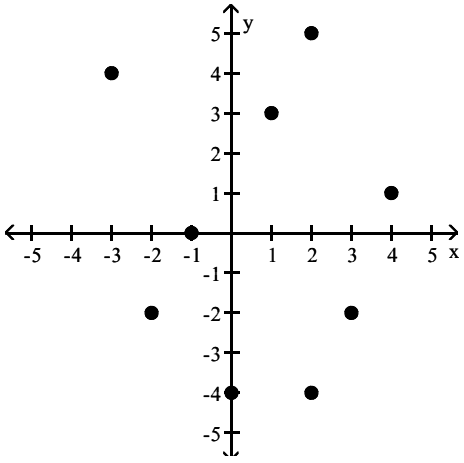
66)



A) Yes B) No

Answer: A

67)

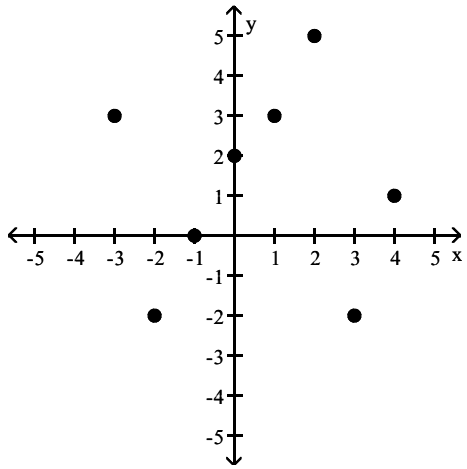


A) No B) Yes

Answer: A

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68)



A) No B) Yes

Answer: B

Determine whether S defines a function.

69) S = {(–2, 5), (2, –7), (6, –4), (8, –8), (11, 7)}

A) No B) Yes

Answer: B

70) S = {(–9, 9), (–9, 2), (–1, –7), (3, 8), (8, –2)}

A) No B) Yes

Answer: A

71) S = {(–5, –2), (–2, 3), (4, –6), (7, –8)}

A) Yes B) No

Answer: A

72) S = {(–6, –8), (–6, –1), (–1, –9), (4, –3), (9, 7)}

A) No B) Yes

Answer: A

73) S = {(–8, –8), (–3, 2), (–1, –1), (3, –6)}

A) Yes B) No

Answer: A

74) S = {(–5, –2), (–1, 1), (2, 2), (2, 5)}

A) No B) Yes

Answer: A

75) S = {(–5, –6), (–2, –3), (3, 2), (6, –2)}

A) No B) Yes

Answer: B

76) S = {(–3, 3), (3, 1), (6, 9), (9, 3), (11, 1)}

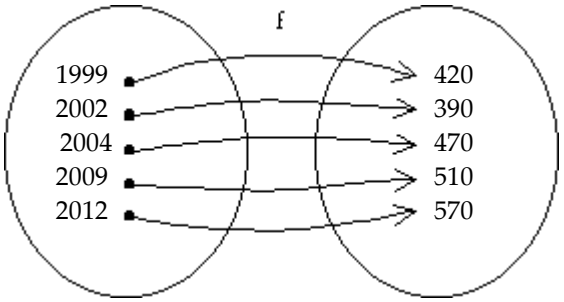
A) Yes B) No

Answer: A

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Solve the problem.

77) The function f, given in the diagram below, computes the average cost of an item during year x. Evaluate f(2004).



A) 420 B) 470 C) 570 D) 510

Answer: B

78) The function given by the equation y = 3.785x will convert x gallons into y liters. If a container will hold 28 gallons, how many liters will it hold? Round your answer to two decimal places.

A) 105.98 liters B) 106.12 liters C) 106.55 liters D) 105.28 liters

Answer: A

79) Bob finds that the cost of driving his truck is 65 cents per mile. Give a numerical representation, in the form of a table, for a function f that computes the cost in dollars of driving x miles. Let x = 10, 20, 30, . . ., 60.

A)

x	10	20	30	40	50	60
y	6.50	13.00	19.50	26.00	32.50	39.00

B)

x	10	20	30	40	50	60
y	10.65	20.65	30.65	92.31	0.07	0.03

C)

x	10	20	30	40	50	60
y	0.07	0.03	0.02	0.02	0.01	0.01

D)

x	10	20	30	40	50	60
y	15.38	30.77	46.15	61.54	76.92	92.31

Answer: A

80) The table lists the monthly precipitation P in Salem, Missouri, where x = 1 corresponds to January and x = 9 corresponds to September.

x (month)	1	2	3	4	5	6	7	8	9
P (in.)	1.2	1.5	0.6	1.3	2.3	2.1	1.6	0.7	1.4

Determine the value of P during April.

A) 1.1 inches B) 1.6 inches C) 2.3 inches D) 1.3 inches

Answer: D

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81) The average price for a box of crackers from 2000 to 2010 can be approximated by P(x) = 0.102(x – 2000) + 1.87, where x is the year. Evaluate P(2008) and round to the nearest hundredth. Interpret the result.

A) P(2008) = 2.69; the average price of a box of crackers in 2008 was $2.69 more than in 2000.
B) P(2008) = 2.78; the average price of a box of crackers in 2008 was $2.78.
C) P(2008) = 1.95; the average price of a box of crackers in 2008 was $1.95.
D) P(2008) = 2.69; the average price of a box of crackers in 2008 was $2.69.

Answer: D

82) The number of televisions in an average home can be modeled by N(x) = 0.04(x – 2004) + 1.4. Evaluate N(2012) and interpret the result.

A) N(2012) = 2.1; there were an average of 2.1 televisions per home in 2012.
B) N(2012) = 1.72; there were an average of 1.72 televisions per home in 2012.
C) N(2012) = 1.5; there were an average of 1.5 televisions per home in 2012.
D) N(2012) = 1.72; there were an average of 1.72 more televisions per home in 2012 than in 2004.

Answer: B

Answer the question.

83) Which of the following correctly defines a function?

A) A function produces exactly one output for each valid input.
B) A function is a relation for which the range contains only unique values.
C) A function is a set of points that can be graphed on a cartesian graph.
D) A function is a relation that transforms input numbers into output numbers.

Answer: A

84) Which of the following transformations is a function?

A) Random Number from 1 to 10 → Random Number from 1 to 10
B) Last Name → Telephone Number
C) Social Security Number → Legal Last Name
D) Daily High Temperature → Date

Answer: C

Determine whether f is a linear function. If f is linear, give the values for m and b so that f may be expressed as f(x) = mx + b.

85) $f(x) = \frac{1}{7}x - 2$

A) Linear; $m = \frac{1}{7}$, $b = -2$
B) Linear; $m = -\frac{1}{7}$, $b = 2$
C) Nonlinear
D) Linear; $m = 7$, $b = 2$

Answer: A

86) $f(x) = \frac{3}{x}$

A) Linear; $m = 3$, $b = 0$
B) Nonlinear
C) Linear; $m = \frac{1}{3}$, $b = 0$
D) Linear; $m = 0$, $b = \frac{1}{3}$

Answer: B

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87) f(x) = –8x

A) Linear; m = 8, b = 1

B) Linear; m = –8, b = 0

C) Nonlinear

D) Linear; m = $-\frac{1}{8}$, b = 0

Answer: B

88) f(x) = 8.7 – 3.8x

A) Linear; m = 8.7, b = –3.8

B) Nonlinear

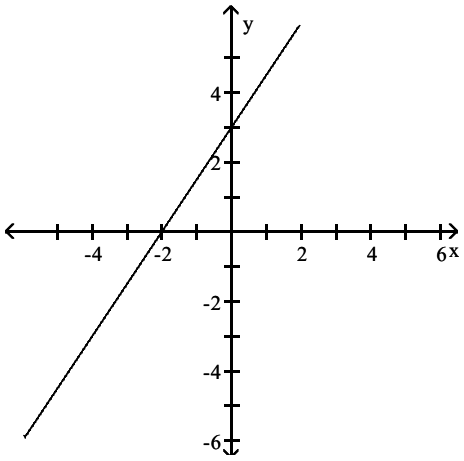
C) Linear; m = –3.8, b = 8.7

D) Linear; m = 3.8, b = –8.7

Answer: C

Determine whether the graph represents a linear function.

89)

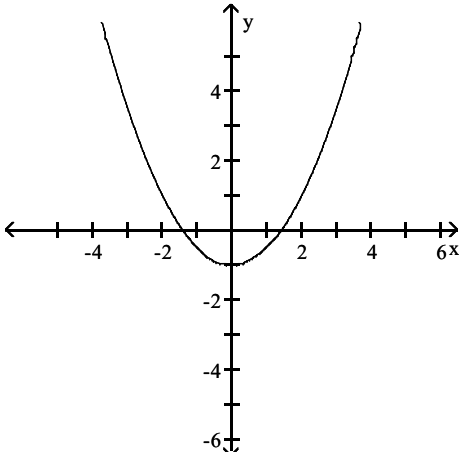


A) No

B) Yes

Answer: B

90)



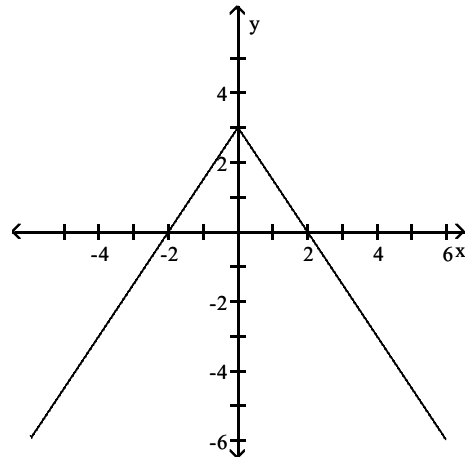
A) No

B) Yes

Answer: A

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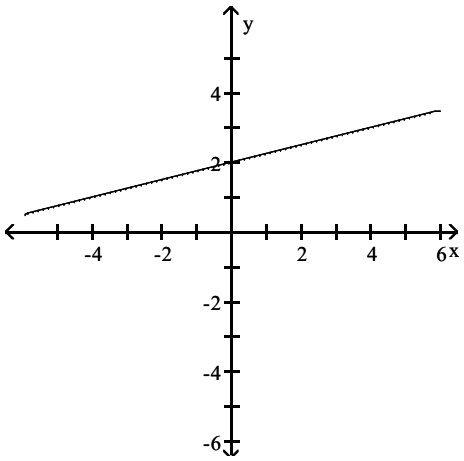
91)



A) Yes B) No

Answer: B

92)



A) Yes B) No

Answer: A

Determine whether f(x) could represent a linear function. If it could, write f(x) in the form f(x) = mx + b.

93)

x	1	2	3	4
f(x)	8	10	12	14

A) No B) Yes; f(x) = 2x + 6

Answer: B

94)

x	1	2	3	4
f(x)	6	8	9	19

A) Yes; f(x) = −2x + 4 B) No

Answer: B

95)

x	−2	−1	0	1
f(x)	−6	−1	4	9

A) Yes; f(x) = 5x + 4 B) No

Answer: A

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96)

x	−2	−1	0	1
f(x)	1	5	8	13

A) Yes; $f(x) = 2x - 4$ B) No

Answer: B

Evaluate f(x) at the given value of x.

97) $f(x) = \frac{1}{3}x + \frac{1}{6}; x = 3$

A) $\frac{3}{2}$ B) $\frac{7}{6}$ C) 8 D) $\frac{5}{6}$

Answer: B

98) $f(x) = 8; x = 7$

A) −8 B) 56 C) 8 D) −56

Answer: C

99) $f(x) = 6x - 5; x = -8$

A) −56 B) −20 C) 53 D) −53

Answer: D

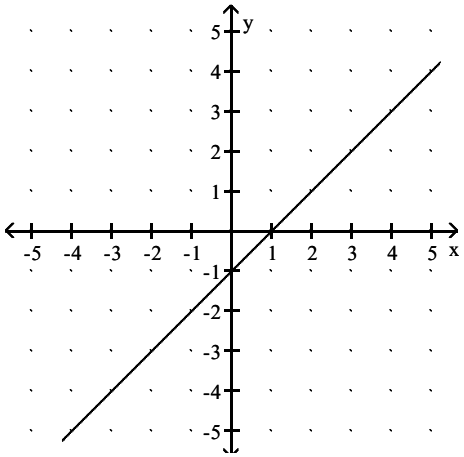
100) $f(x) = 5x - 1.5; x = -2.5$

A) −14 B) −15 C) −11 D) 14

Answer: A

Use the provided graph or table to evaluate the given expression.

101) f(1)

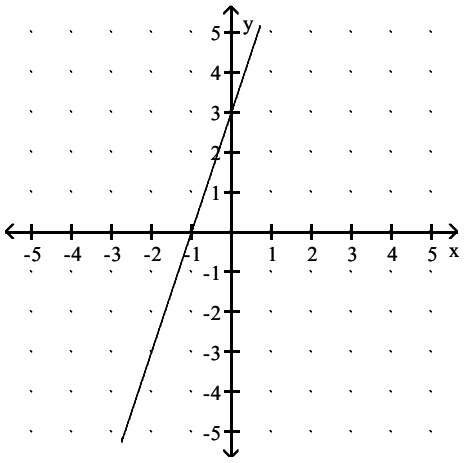


A) −1 B) 1 C) 0 D) −2

Answer: C

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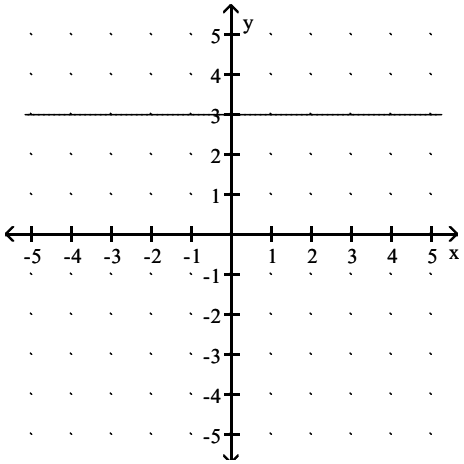
102) f(–1)



A) 0 B) –2 C) –1 D) 1

Answer: A

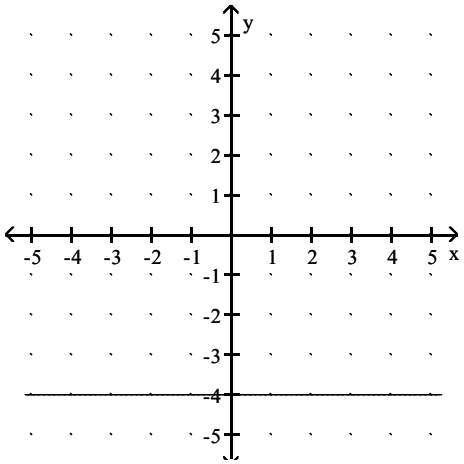
103) f(–4π)



A) Undefined B) –3 C) 3 D) –4

Answer: C

104) f(1.5)



A) Undefined B) 1.5 C) –4 D) 4

Answer: C

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Use the verbal description to write a formula for f(x). Then evaluate the function as indicated.

105) Multiply the input by 3 to obtain the output. Find f(2).

A) f(x) = 3x; 6 B) f(x) = 3x; 5 C) f(x) = –3x; 1 D) f(x) = –3x; –6

Answer: A

106) Multiply the input by 8 and add 1 to obtain the output. Find f(2).

A) f(x) = 8x + 1; 15 B) f(x) = 8x + 1; 17 C) f(x) = 8x – 1; –15 D) f(x) = –8x – 1; –17

Answer: B

107) Multiply the input by 9 and subtract 8 to obtain the output. Find f(1).

A) f(x) = 9x – 8; 1 B) f(x) = –9x + 8; 2 C) f(x) = –9x – 8; –17 D) f(x) = 9x + 8; 17

Answer: A

108) Output 3.9 for every input. Find f(1).

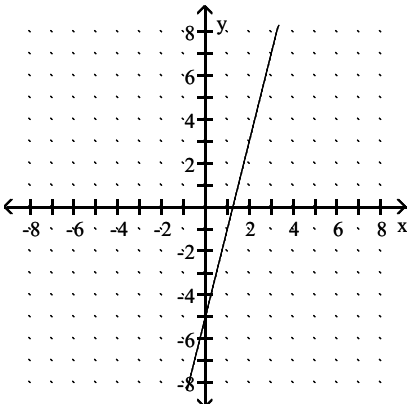
A) f(x) = 3.9; 3.9 B) f(x) = 3.9; 4.2 C) f(x) = 3.9; 1 D) f(x) = 1; 3.9

Answer: A

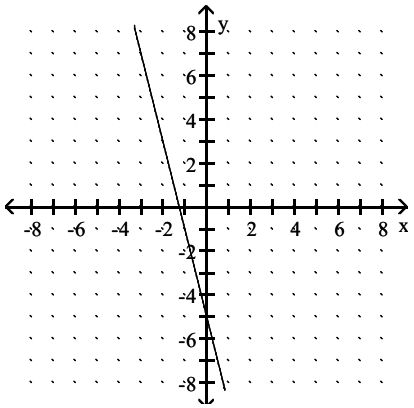
Match f(x) with its graph.

109) f(x) = 4x + 5

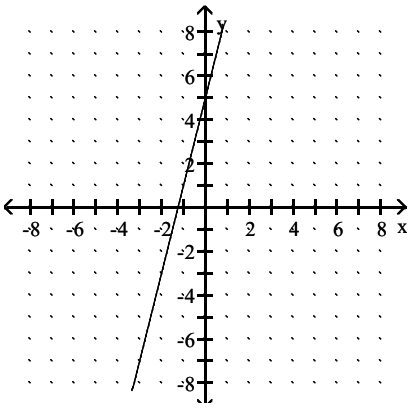
A)



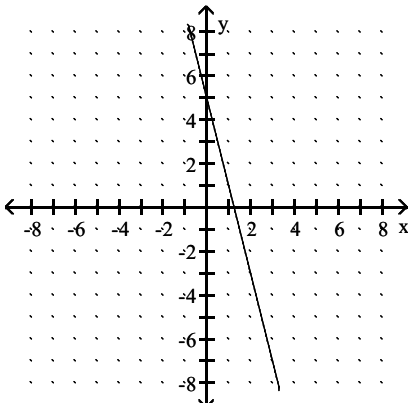
B)



C)



D)

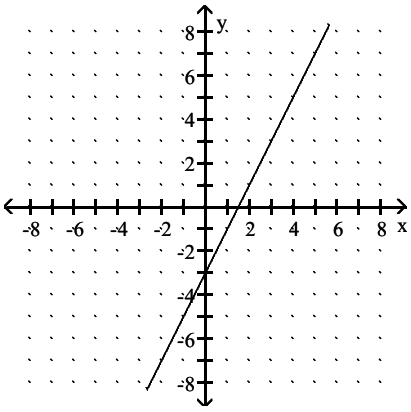


Answer: C

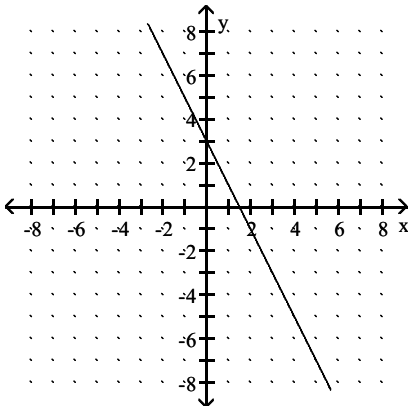
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110) f(x) = 2x – 3

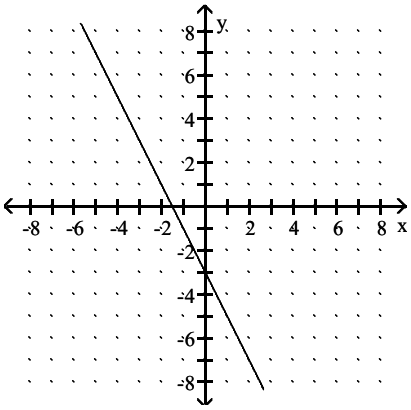
A)



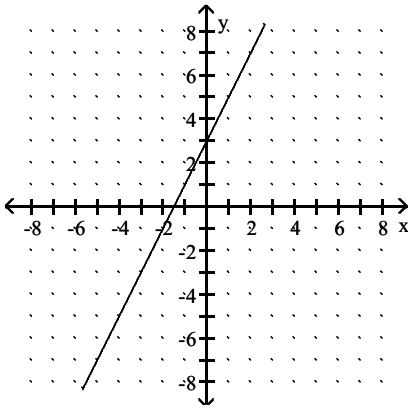
B)



C)



D)

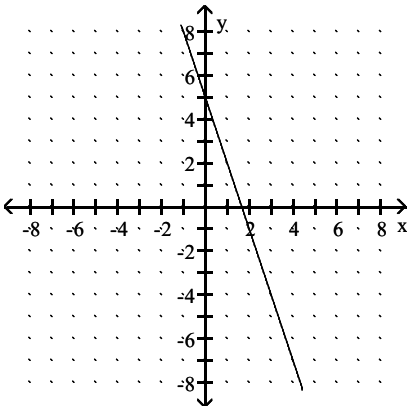


Answer: A

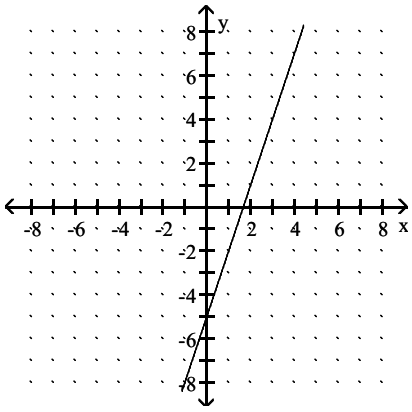
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111) f(x) = –3x + 5

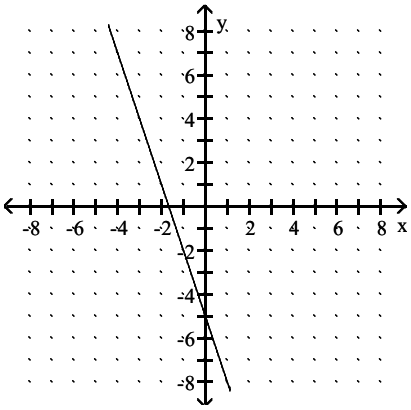
A)



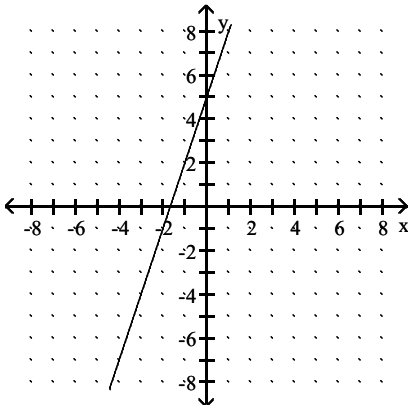
B)



C)



D)

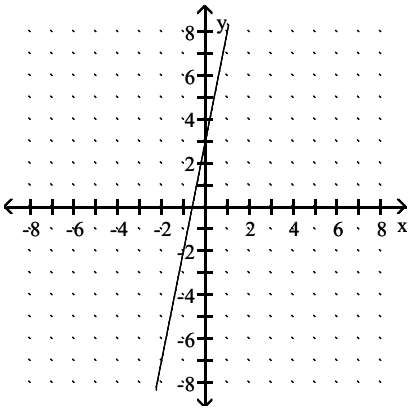


Answer: A

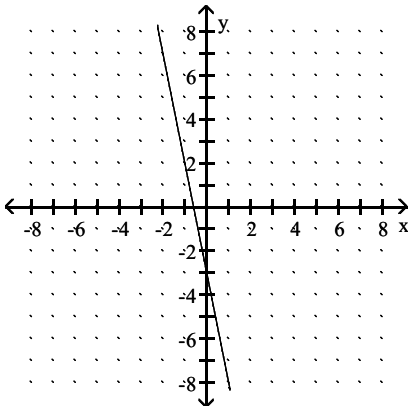
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112) f(x) = –5x – 3

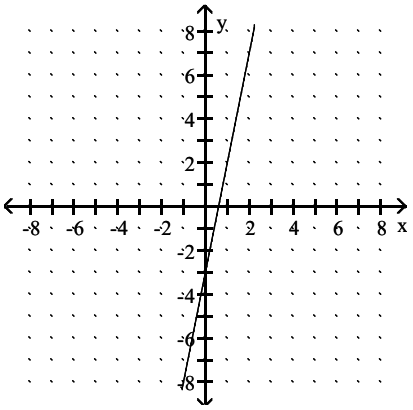
A)



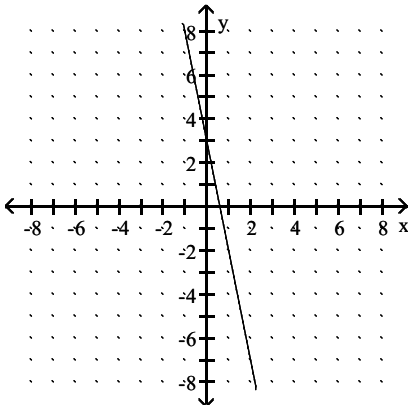
B)



C)



D)

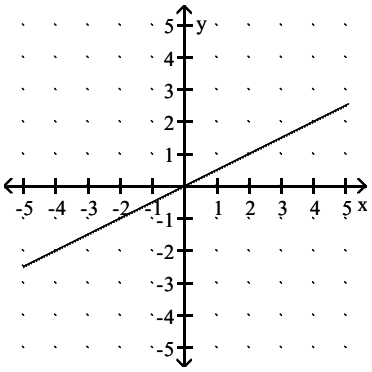


Answer: B

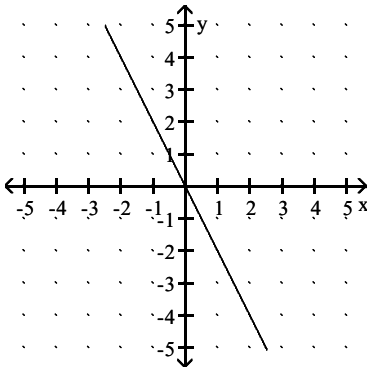
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113) f(x) = 2x

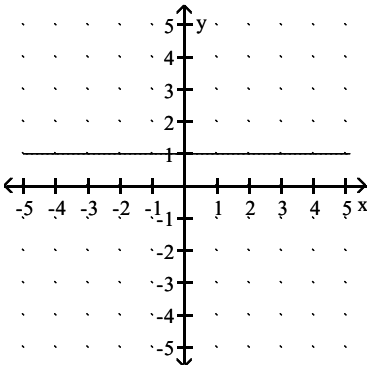
A)



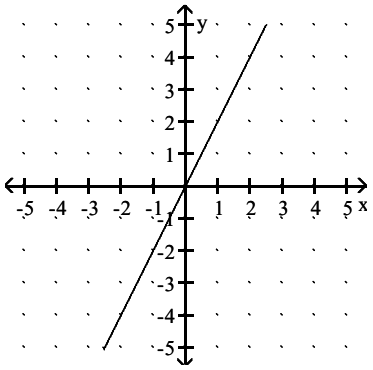
B)



C)



D)

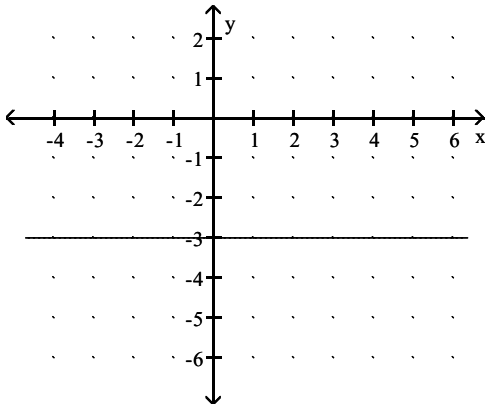


Answer: D

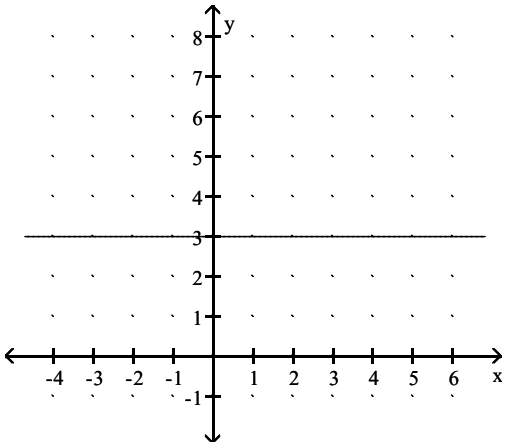
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114) f(x) = –3

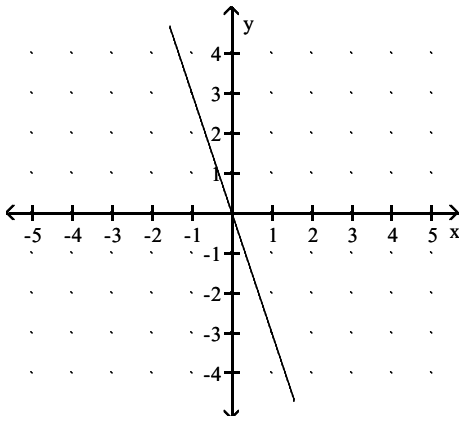
A)



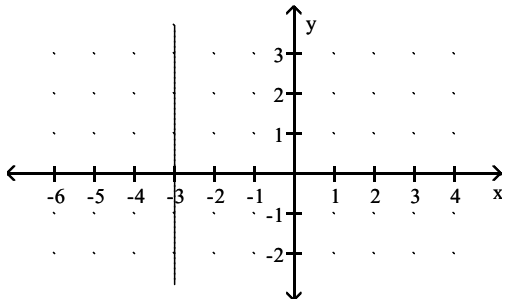
B)



C)



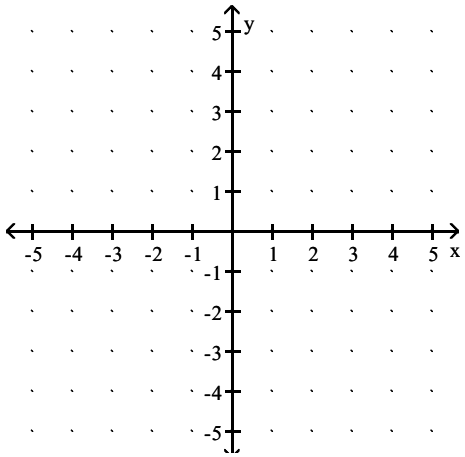
D)



Answer: A

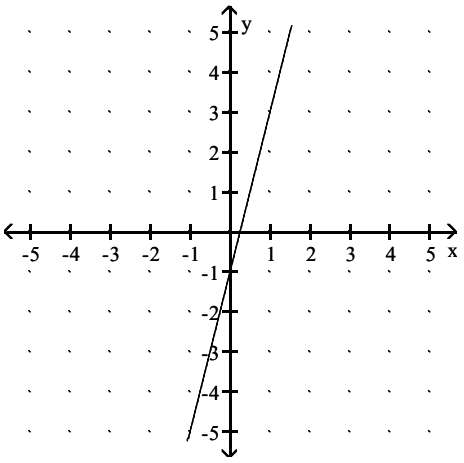
Sketch the graph of f.

115) f(x) = –4x + 1

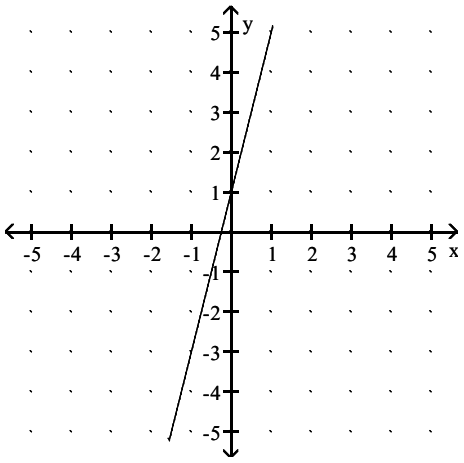


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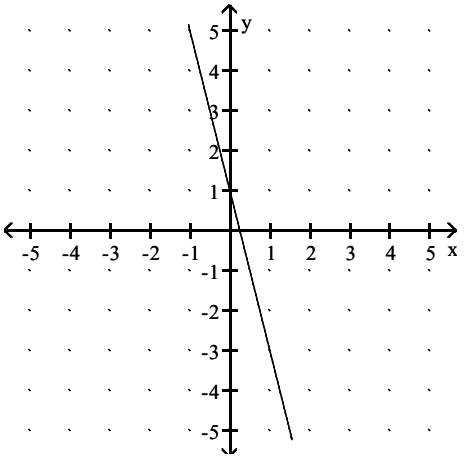
A)



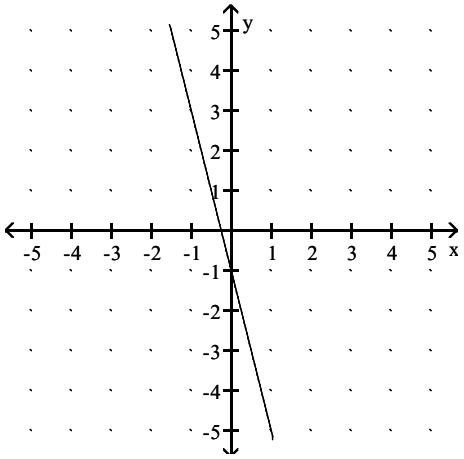
B)



C)

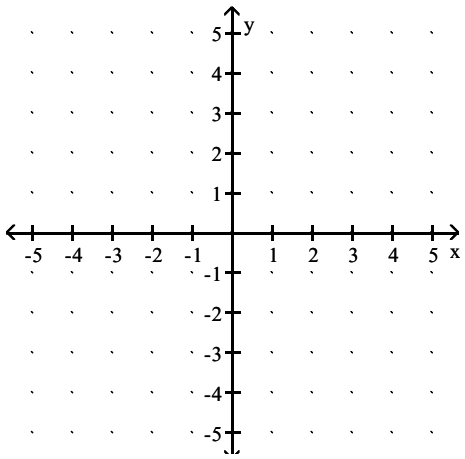


D)



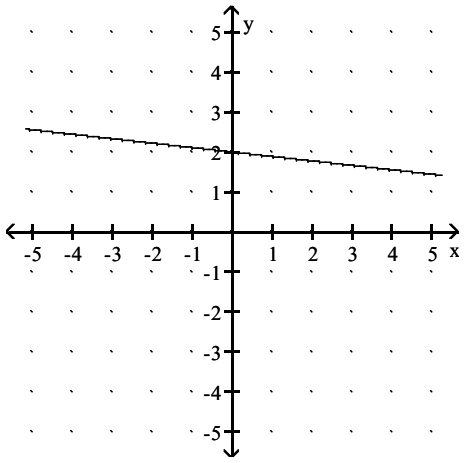
Answer: C

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

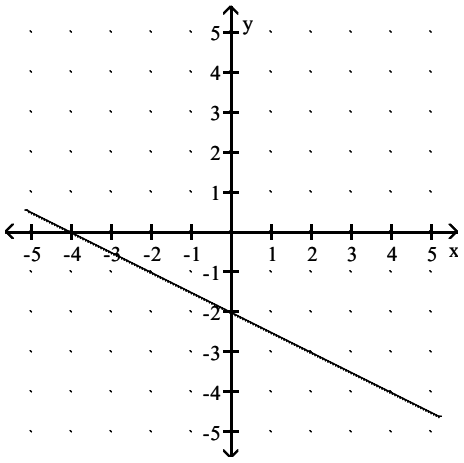


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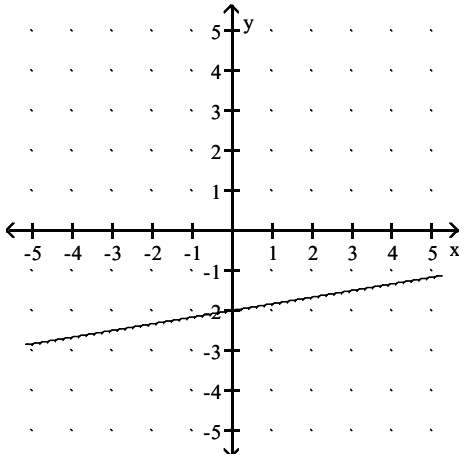
A)



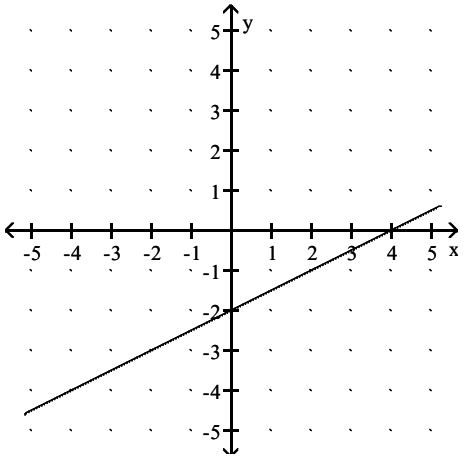
B)



C)

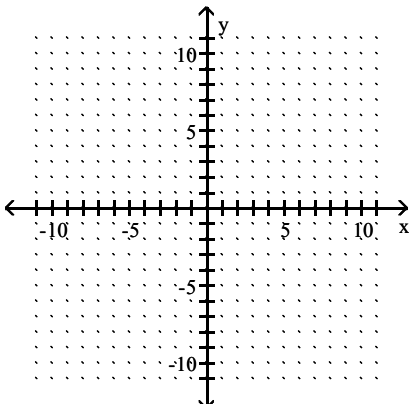


D)



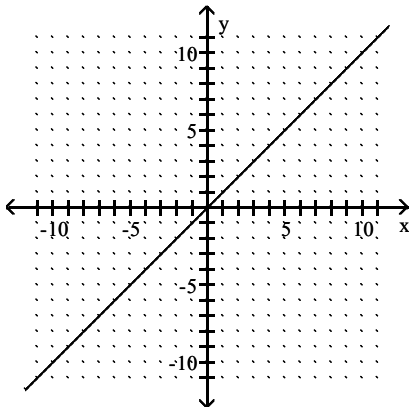
Answer: D

117) $f(x) = \frac{1}{6}x$

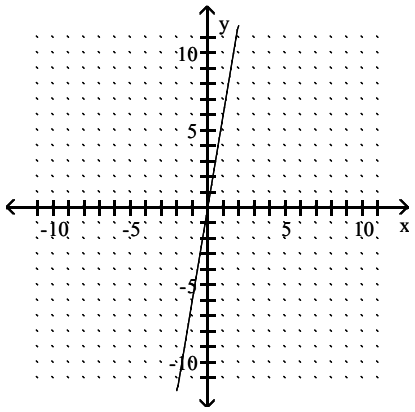


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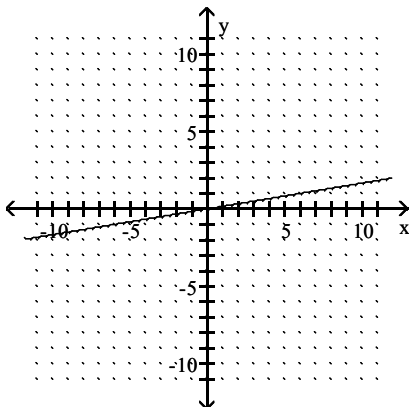
A)



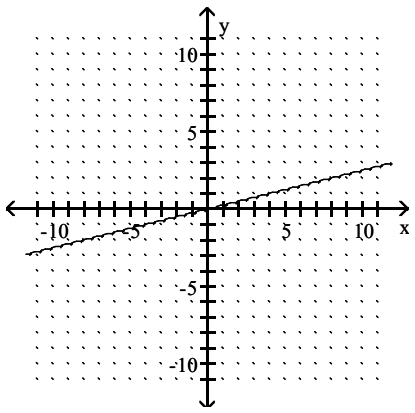
B)



C)

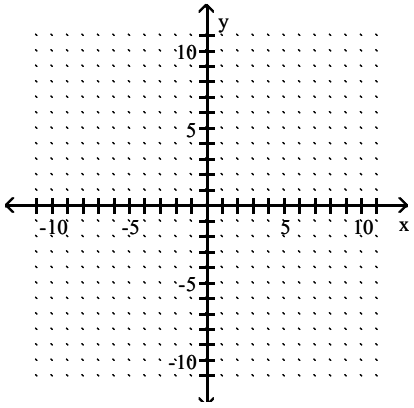


D)



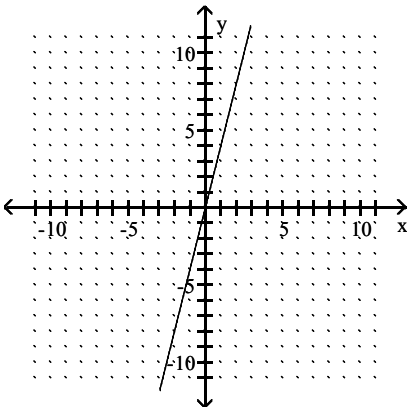
Answer: C

118) f(x) = 4x + 5

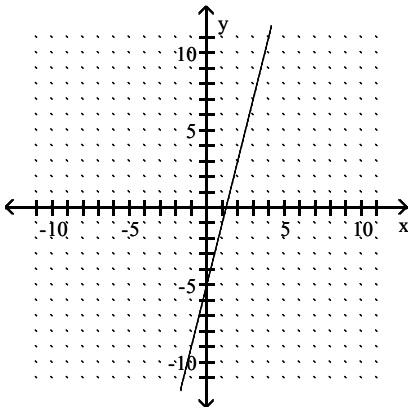


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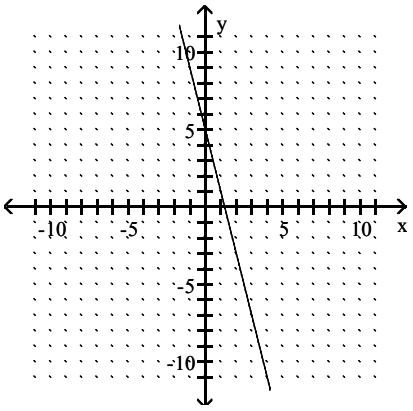
A)



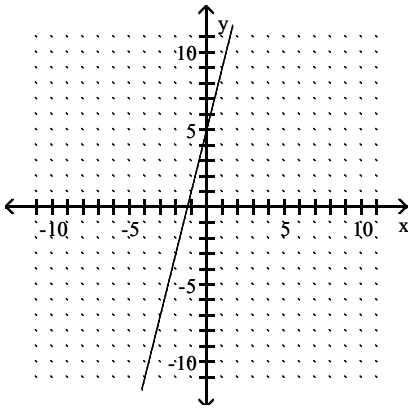
B)



C)



D)



Answer: D

Write a symbolic representation for the linear function f that computes the following.

119) The number of ounces in x pounds

A) f(x) = 16x B) f(x) = 4x C) f(x) = 16 + x D) $f(x) = \frac{1}{16}x$

Answer: A

120) The number of inches in x yards

A) $f(x) = \frac{1}{12}x$ B) $f(x) = \frac{1}{36}x$ C) f(x) = 36x D) f(x) = 12x

Answer: C

121) The cost of renting a car for x days with a total of 80 miles if there is a fixed charge of $27 per day and a charge of $0.25 per mile.

A) f(x) = 27x + 20 B) f(x) = x + 20 C) f(x) = 80x + 27 D) f(x) = 27x + 0.25

Answer: A

122) The total number of hours in a week for week x

A) f(x) = 24 B) f(x) = 7x C) f(x) = 52 D) f(x) = 168

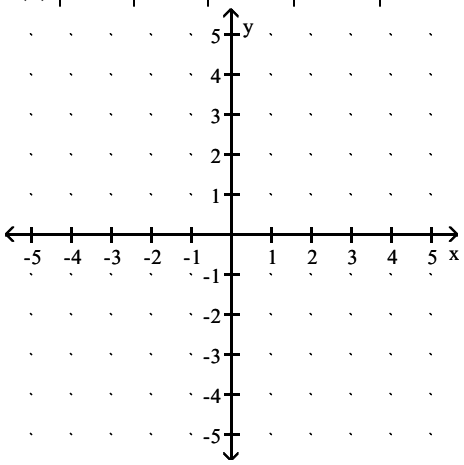
Answer: D

Make a numerical representation (table) of f for x = –2, –1, . . . , 2 then graph the function. Round table values to the nearest hundredth when necessary.

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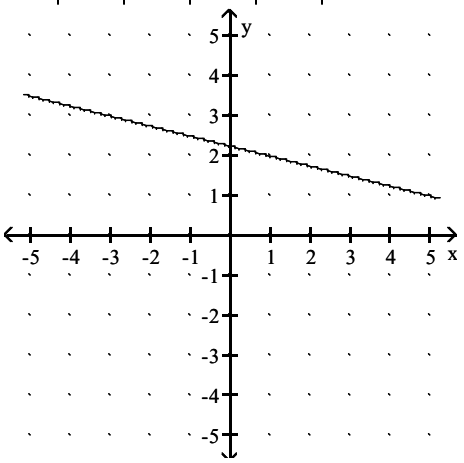
123) $f(x) = \frac{1}{4}x - \sqrt{5}$

x	−2	−1	0	1	2
f(x)					



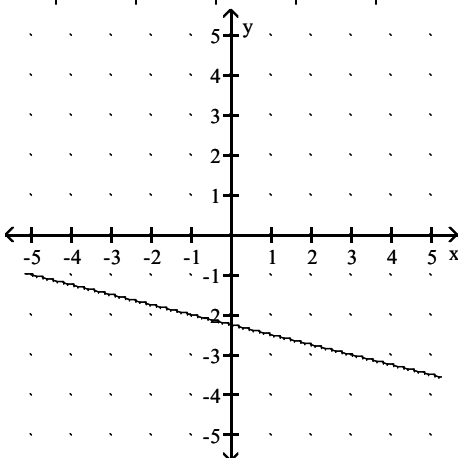
A)

x	−2	−1	0	1	2
f(x)	2.74	2.49	2.24	1.99	1.74



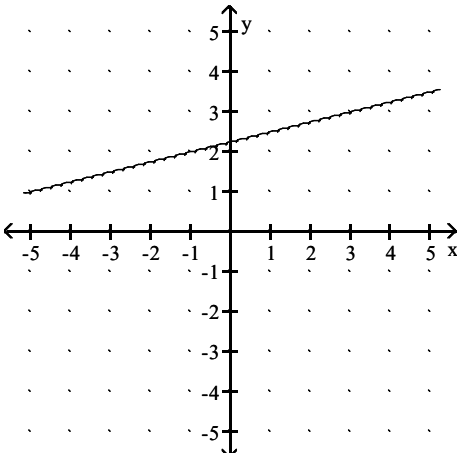
B)

x	−2	−1	0	1	2
f(x)	−1.74	−1.99	−2.24	−2.49	−2.74



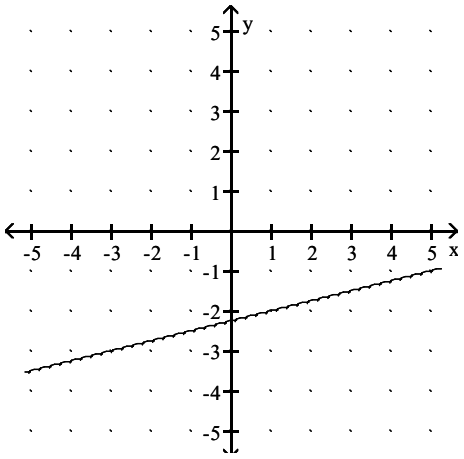
C)

x	−2	−1	0	1	2
f(x)	1.74	1.99	2.24	2.49	2.74



D)

x	−2	−1	0	1	2
f(x)	−2.74	−2.49	−2.24	−1.99	−1.74

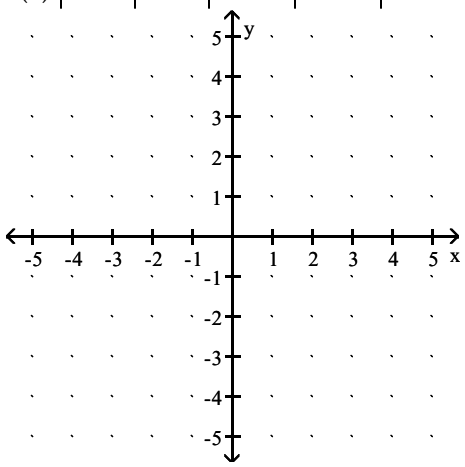


Answer: D

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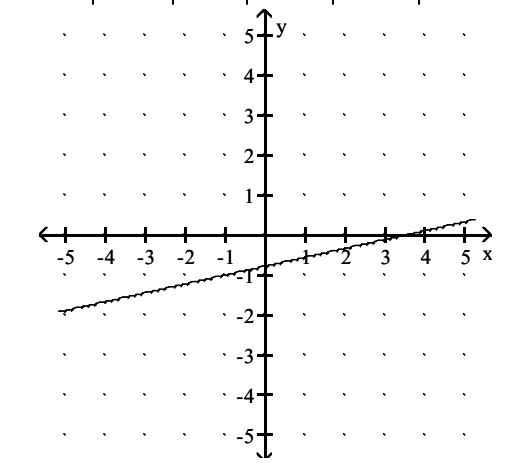
124) $f(x) = \dfrac{7 - 2x}{9}$

x	−2	−1	0	1	2
f(x)					



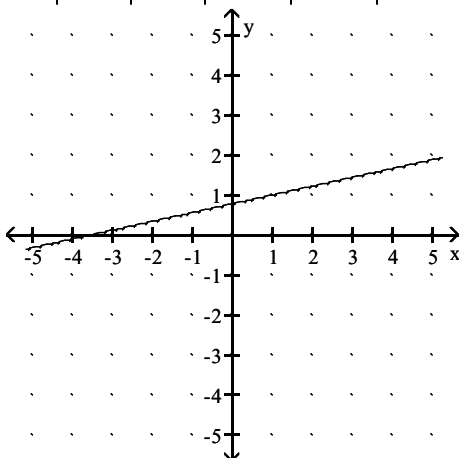
A)

x	−2	−1	0	1	2
f(x)	−1.22	−1	−0.78	−0.56	−0.33



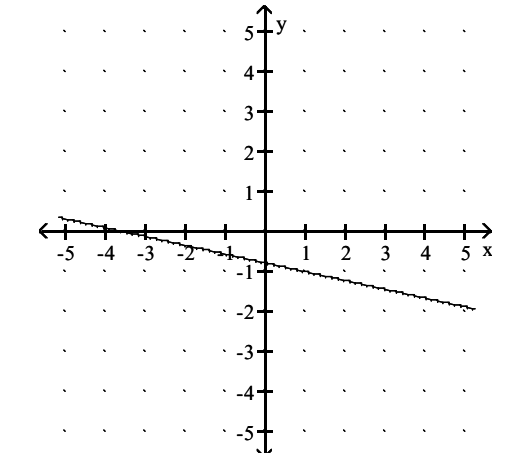
B)

x	−2	−1	0	1	2
f(x)	0.33	0.56	0.78	1	1.22



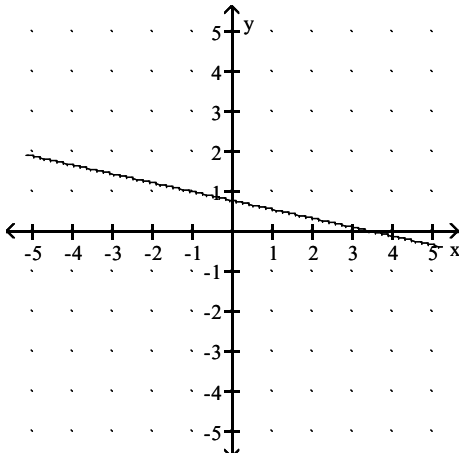
C)

x	−2	−1	0	1	2
f(x)	−0.33	−0.56	−0.78	−1	−1.22



D)

x	−2	−1	0	1	2
f(x)	1.22	1	0.78	0.56	0.33



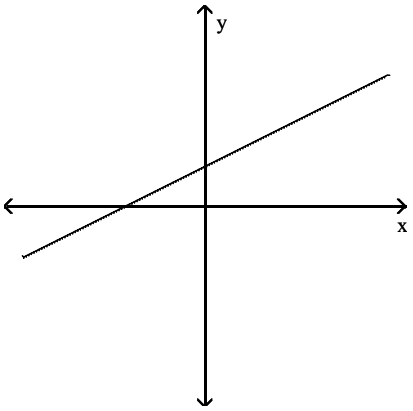
Answer: D

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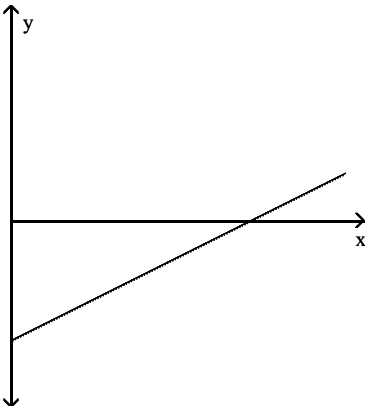
Match the situation to the graph that models it best.

125) The remaining hours y that a battery will work after it has been used for x hours

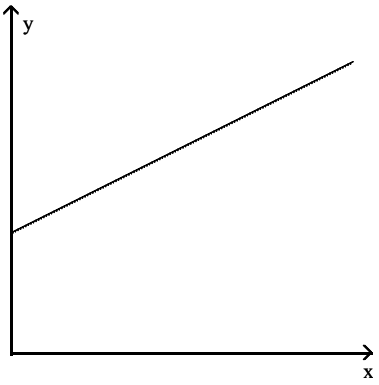
A)



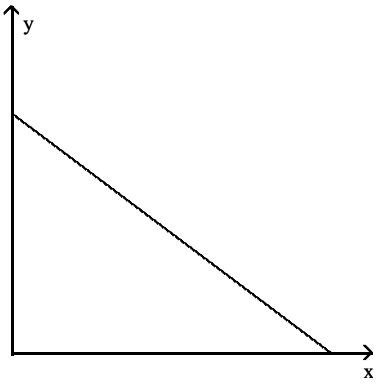
B)



C)



D)

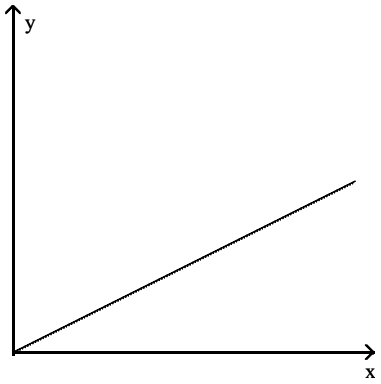


Answer: D

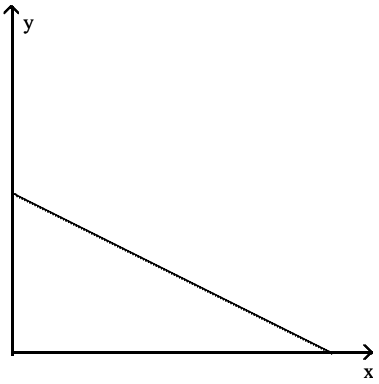
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126) The amount of money y spent on x items having the same cost

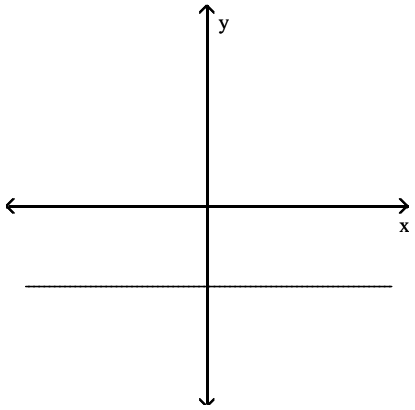
A)



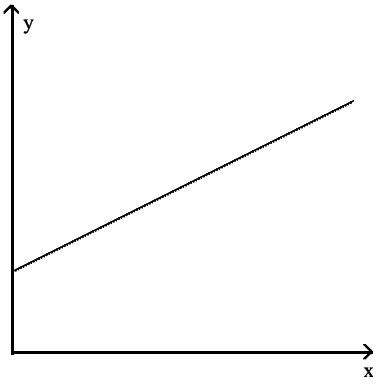
B)



C)



D)

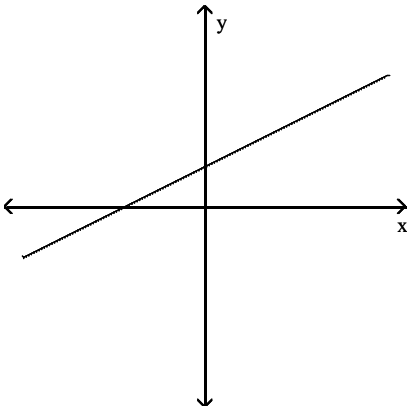


Answer: A

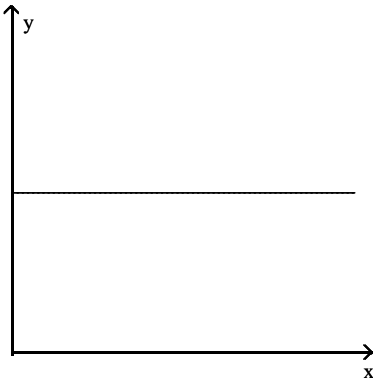
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127) The approximate distance that the moon is from earth at time x

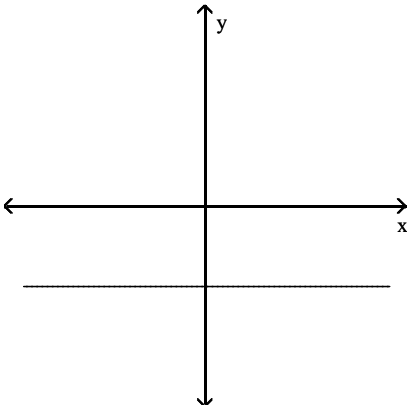
A)



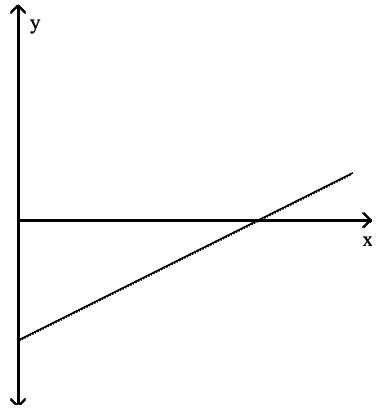
B)



C)



D)

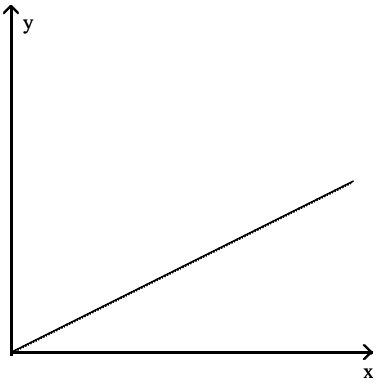


Answer: B

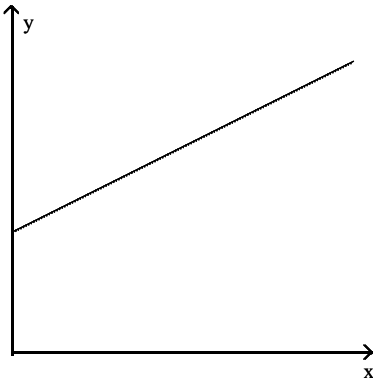
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128) The average cost y of college tuition from 2000 to 2010

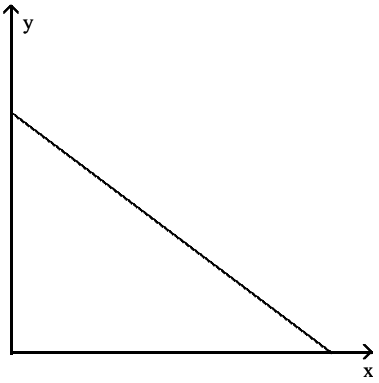
A)



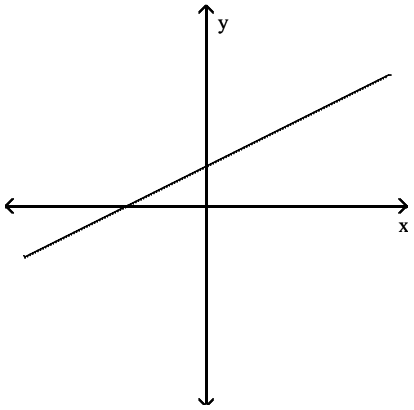
B)



C)



D)

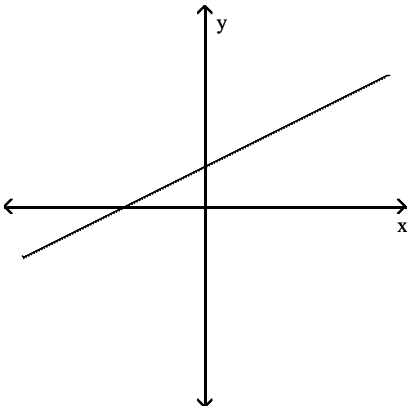


Answer: B

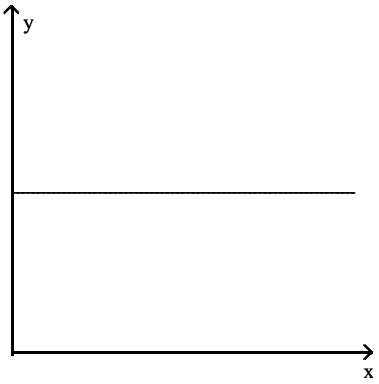
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129) The profit (revenue minus cost) from selling x items

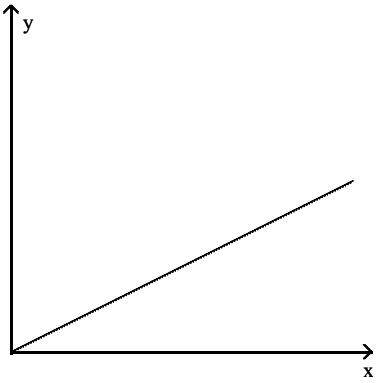
A)



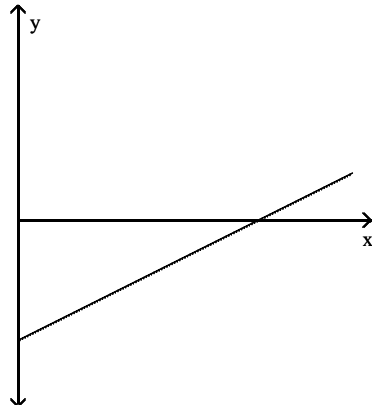
B)



C)



D)



Answer: D

Solve the problem.

130) The table below gives the sales tax rate as a percent in a certain city between 2007 and 2012:

Year	2007	2008	2009	2010	2011	2012
Rate (%)	4	4	4	4	4	4

Write a symbolic representation for a function f that models this data.

A) $f(x) = 4$ B) $f(x) = 4x$ C) $f(x) = \frac{1}{4}x$ D) $f(x) = \frac{1}{4}$

Answer: A

131) In a certain state, 4400 acres of farmland are being developed into housing developments per year. Find $f(x) = ax$ so that f models the acres of farmland lost to development in x years.

A) $f(x) = 4400x$ B) $f(x) = 2240x$ C) $f(x) = -4400x$ D) $f(x) = -2240x$

Answer: A

132) In a certain country the number of acres of farmland is modeled by $f(x) = 1{,}362{,}748 - 153x$, where x is the year with $2002 \le x \le 2012$. Evaluate f(2012) and interpret the result.

A) 1,054,912; In 2012, 1,054,912 acres of farmland are converted to other uses.
B) 754,912; In 2012, there are 754,912 acres of farmland.
C) 1,054,912; In 2012, there are 1,054,912 acres of farmland.
D) 747,076; In 2012, 747,076 acres of farmland are converted to other uses.

Answer: C

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133) For the years 2003 through 2012, the number of successful free throws made by Andy in a grade school league are given by $f(x) = 9x - 17{,}901$, for $2003 \le x \le 2012$. What is happening to the number of free throws over this time period?

A) The number of free throws is increasing from 2003 through 2006 and then decreasing from 2007 through 2012.

B) The number of free throws is increasing.

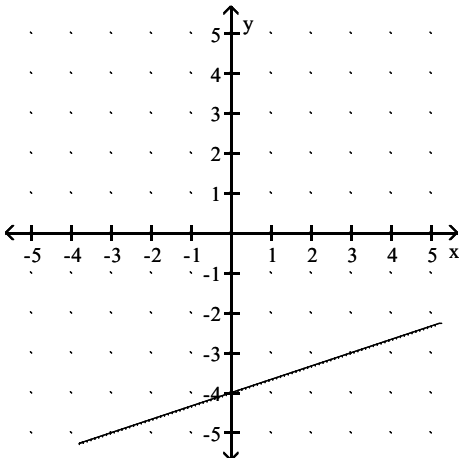
C) The number of free throws is decreasing.

D) The number of free throws is constant.

Answer: B

Find the slope of the line using the concept of rise over run.

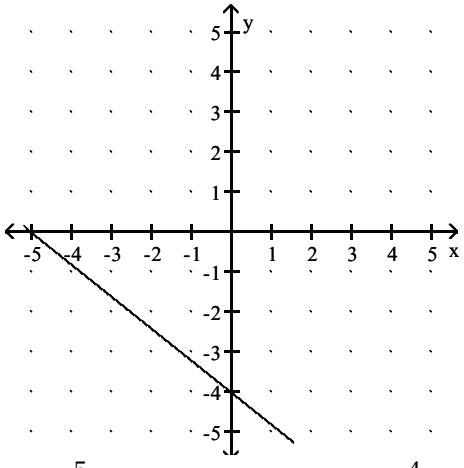
134)



A) $\frac{1}{4}$ B) 3 C) $\frac{1}{3}$ D) –3

Answer: C

135)

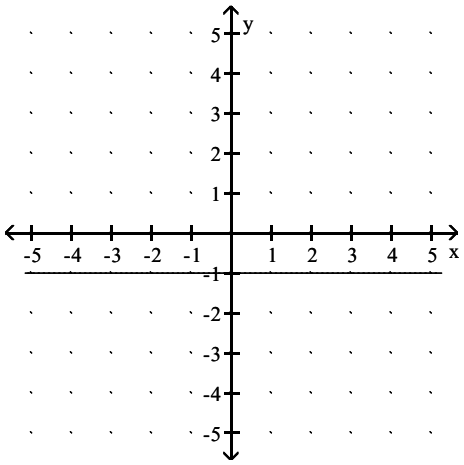


A) $\frac{5}{4}$ B) $\frac{4}{5}$ C) $-\frac{5}{4}$ D) $-\frac{4}{5}$

Answer: D

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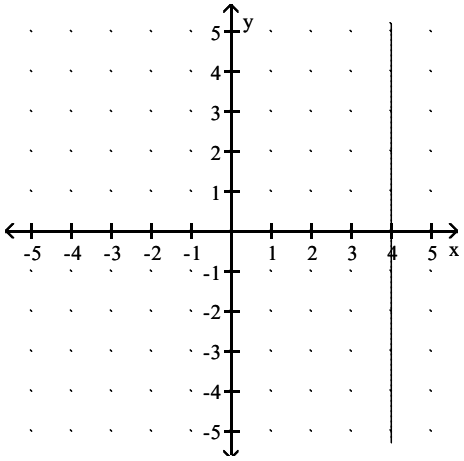
136)



A) 1 B) 0 C) Undefined D) –1

Answer: B

137)



A) –1 B) $\frac{2}{3}$ C) Undefined D) 0

Answer: C

Find the slope of the line passing through the two points.

138) (7, –3) and (4, 3)

A) –2 B) 6 C) 3 D) 2

Answer: A

139) (–9, –2) and (–2, 8)

A) Undefined B) $\frac{7}{10}$ C) 6 D) $\frac{10}{7}$

Answer: D

140) (–9, –8) and (–5, 4)

A) 4 B) 12 C) 3 D) Undefined

Answer: C

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141) (1, –5) and (6, 9)

A) Undefined B) 1 C) $\frac{5}{14}$ D) $\frac{14}{5}$

Answer: D

142) (–2, –8) and (–2, 8)

A) 16 B) 2 C) Undefined D) 8

Answer: C

143) (–7, –7) and (6, –7)

A) 1 B) 0 C) –2 D) 2

Answer: B

144) $\left(-\frac{2}{7}, -\frac{3}{7}\right)$ and $\left(\frac{3}{7}, \frac{2}{7}\right)$

A) 0 B) $\frac{1}{7}$ C) –1 D) 1

Answer: D

145) (–4, 7) and (1, 7)

A) – 4 B) 0 C) 1 D) –1

Answer: B

146) (1977, 14) and (1987, 22)

A) 0 B) $\frac{4}{5}$ C) $\frac{2}{5}$ D) $\frac{5}{4}$

Answer: B

147) (2.8, 3.1) and (–1.6, 4.8)

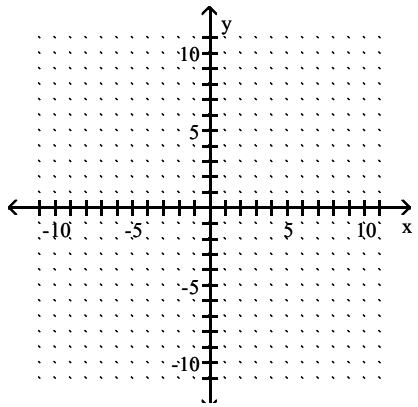
Round your answer to 4 decimal places.

A) –0.2826 B) –0.3864 C) –0.9593 D) –0.7774

Answer: B

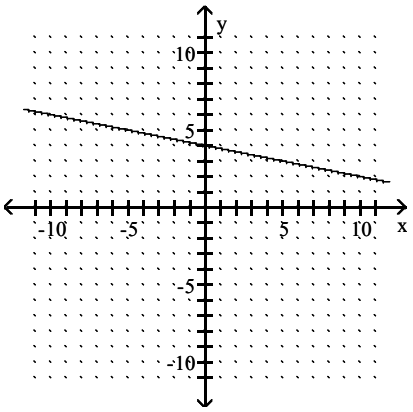
Sketch a line passing through the given point with slope m.

148) (0, 4), $m = \frac{1}{5}$

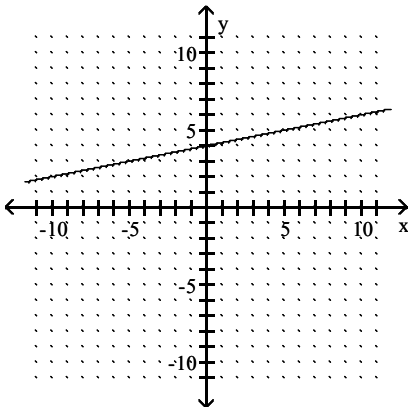


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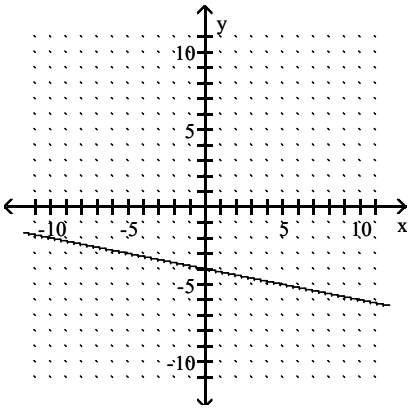
A)



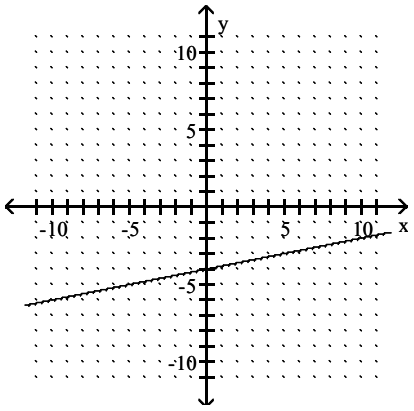
B)



C)

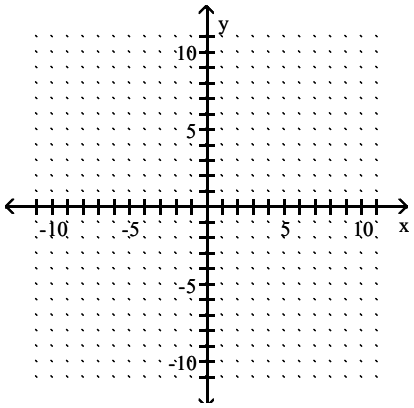


D)



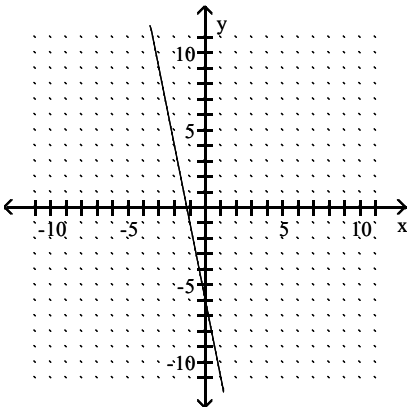
Answer: B

149) $(0, 6)$, $m = -\frac{1}{5}$

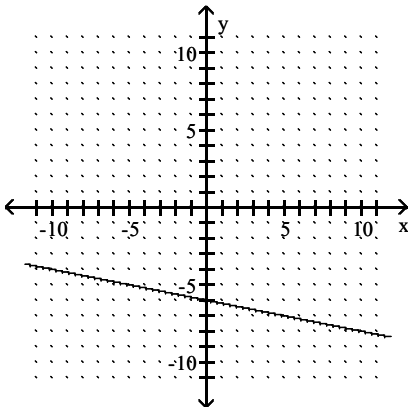


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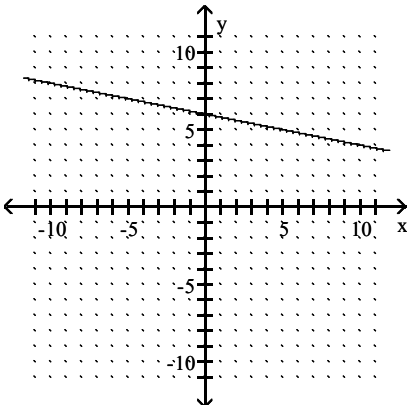
A)



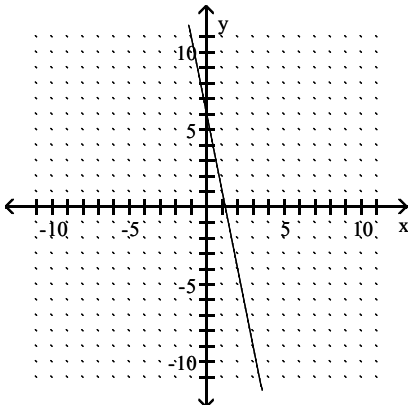
B)



C)

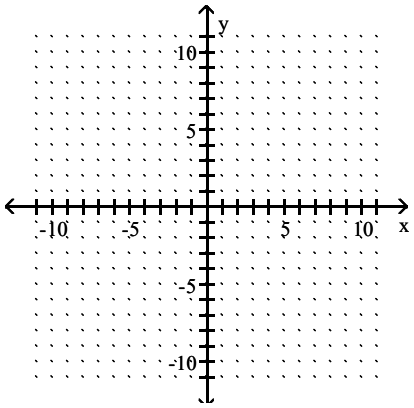


D)



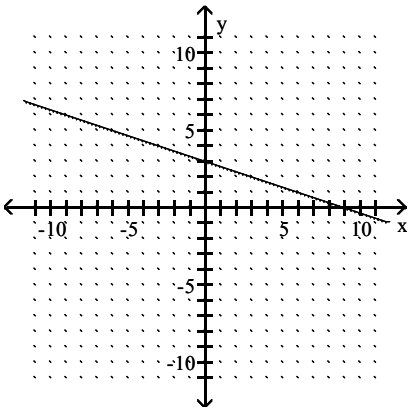
Answer: C

150) $(9, 0)$, $m = -\frac{1}{3}$

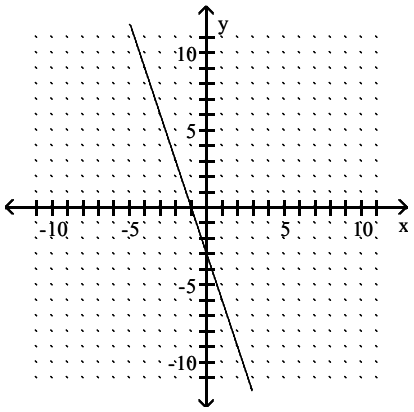


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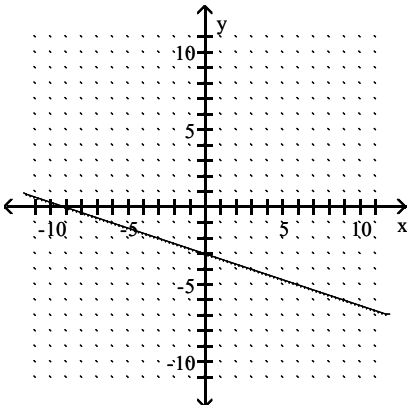
A)



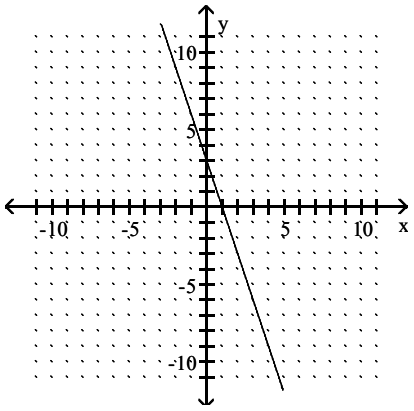
B)



C)

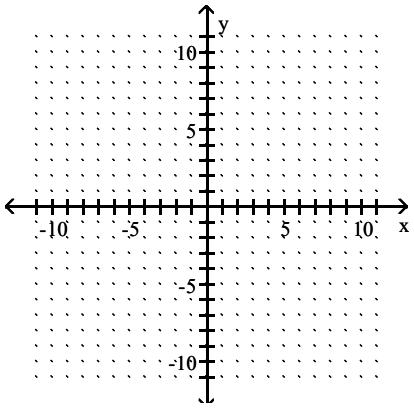


D)



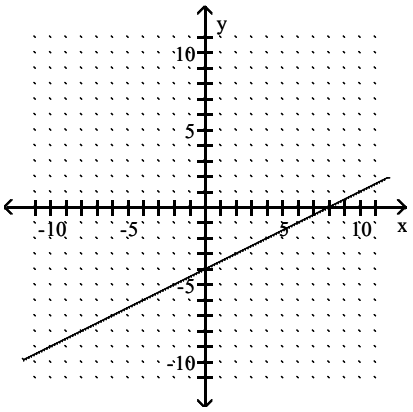
Answer: A

151) $(4, 2)$, $m = \frac{3}{2}$

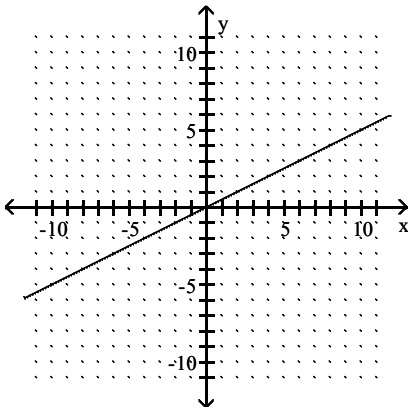


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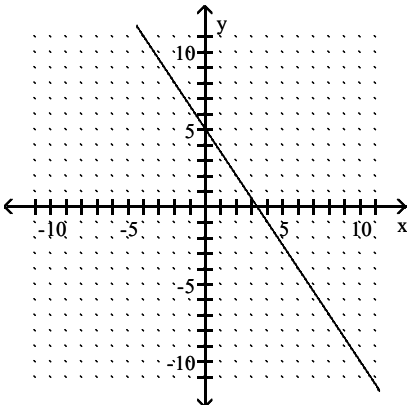
A)



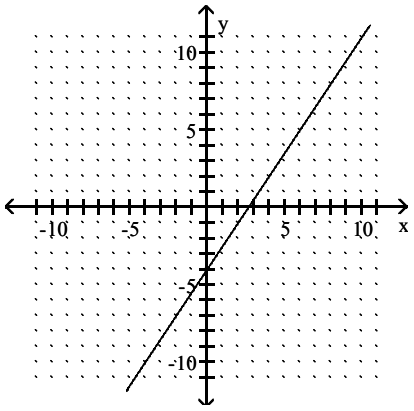
B)



C)

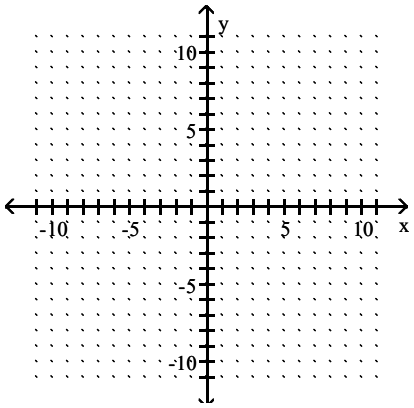


D)



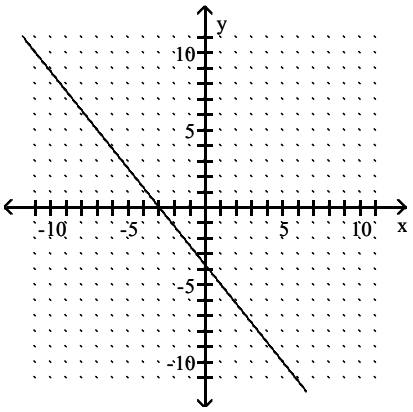
Answer: D

152) $(1, 5),\ m = -\frac{5}{4}$

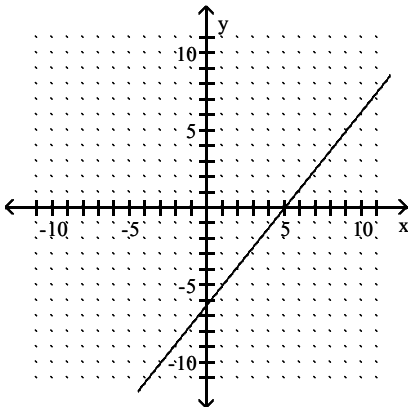


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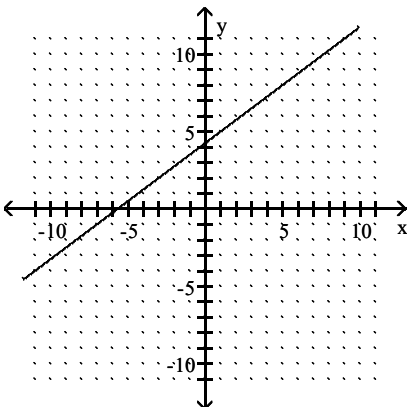
A)



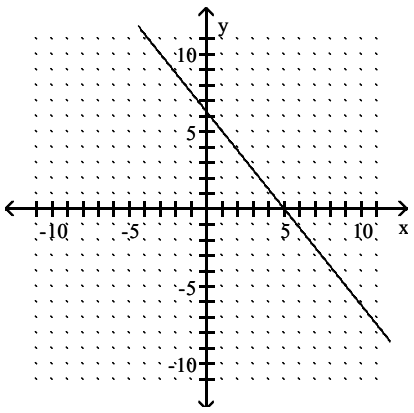
B)



C)



D)



Answer: D

Find the slope and y–intercept of the line.

153) $y = 2x + 8$

A) Slope 8, y–intercept –2
B) Slope 2, y–intercept 8
C) Slope –2, y–intercept 8
D) Slope 8, y–intercept 2

Answer: B

154) $y = -7x - 6$

A) Slope –6, y–intercept –7
B) Slope 7, y–intercept –6
C) Slope –7, y–intercept –6
D) Slope –6, y–intercept 7

Answer: C

155) $y = \frac{3}{4}x - 3$

A) Slope –3, y–intercept $\frac{3}{4}$
B) Slope $\frac{4}{3}$, y–intercept –4
C) Slope $\frac{3}{4}$, y–intercept –3
D) Slope $\frac{3}{5}$, y–intercept 3

Answer: C

156) $y = 8$

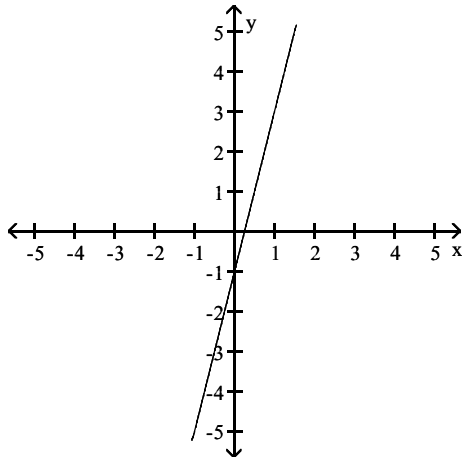
A) Slope 8, y–intercept 0
B) Slope 0, y–intercept 8
C) Slope 8, y–intercept 8
D) Slope 0, y–intercept 0

Answer: B

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Use the graph to express the line in slope–intercept form.

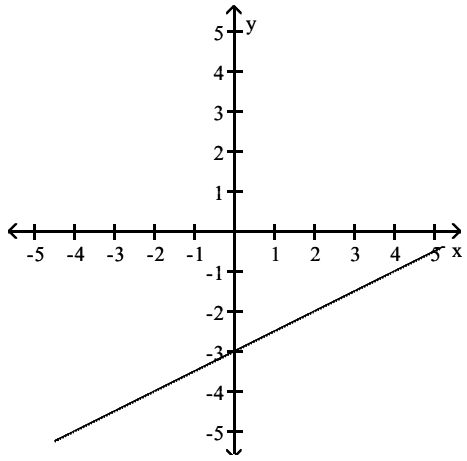
157)



A) $y = -4x - 1$ B) $y = 4x - 2$ C) $y = 4x - 1$ D) $y = \frac{1}{4}x - 1$

Answer: C

158)

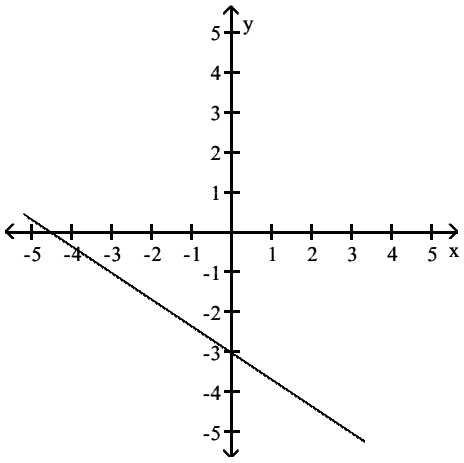


A) $y = -\frac{1}{2}x - 4$ B) $y = \frac{1}{3}x - 3$ C) $y = -2x - 3$ D) $y = \frac{1}{2}x - 3$

Answer: D

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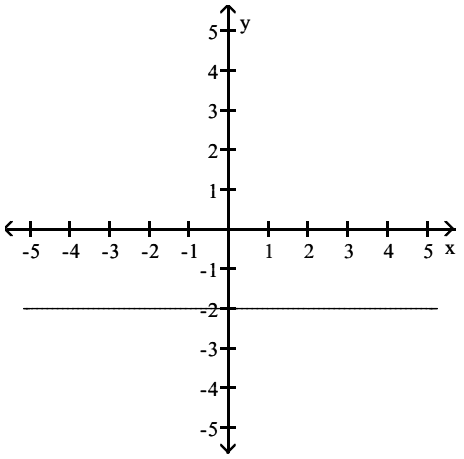
159)



A) $y = -\frac{3}{2}x - 4$ B) $y = \frac{2}{3}x - 3$ C) $y = -\frac{2}{3}x - 3$ D) $y = -\frac{3}{2}x - 3$

Answer: C

160)



A) $y = -2$ B) $x = -2$ C) $x = 2$ D) $y = -2x$

Answer: A

Write the slope–intercept form for a line satisfying the stated conditions.

161) Slope $-\frac{2}{7}$; y–intercept $\frac{32}{7}$

A) $f(x) = \frac{2}{7}x - \frac{32}{7}$ B) $f(x) = \frac{2}{7}x + \frac{32}{7}$ C) $f(x) = -\frac{2}{7}x + \frac{32}{7}$ D) $f(x) = -\frac{2}{7}x - \frac{32}{7}$

Answer: C

162) Slope $-\frac{5}{6}$; y–intercept 5

A) $f(x) = -\frac{5}{6}x - 5$ B) $f(x) = -\frac{5}{6}x + 5$ C) $f(x) = \frac{5}{6}x - 5$ D) $f(x) = \frac{5}{6}x + 5$

Answer: B

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163) Slope $-\frac{5}{8}$; y–intercept 4

A) $f(x) = \frac{5}{8}x + 4$ B) $f(x) = \frac{5}{8}x - 4$ C) $f(x) = -\frac{5}{8}x + 4$ D) $f(x) = -\frac{5}{8}x - 4$

Answer: C

164) The line passes through $\left(0, -\frac{9}{2}\right)$ and (1, 0).

A) $y = 5x - \frac{11}{2}$ B) $y = -\frac{9}{2}x + \frac{9}{2}$ C) $y = 9x - \frac{9}{2}$ D) $y = \frac{9}{2}x - \frac{9}{2}$

Answer: D

Let f be a linear function. Use the table to find the slope and y–intercept of the graph of f.

165)

x	0	1	2	3
f(x)	1	6	11	16

A) Slope 1, y–intercept 5 B) Slope 5, y–intercept 1

C) Slope –5, y–intercept 1 D) Slope $\frac{1}{5}$, y–intercept –1

Answer: B

166)

x	–2	–1	0	1
f(x)	–7	–2	3	8

A) Slope –5, y–intercept 3 B) Slope –5, y–intercept –3

C) Slope 5, y–intercept –3 D) Slope 5, y–intercept 3

Answer: D

167)

x	–2	–1	0	1
f(x)	6	5	4	3

A) Slope $-\frac{1}{1}$, y–intercept –4 B) Slope –1, y–intercept 4

C) Slope –4, y–intercept $-\frac{1}{1}$ D) Slope 1, y–intercept –4

Answer: B

168)

x	–4	–2	0	2	4
f(x)	–9	–6	–3	0	3

A) Slope 3, y–intercept –3 B) Slope $\frac{3}{2}$, y–intercept –3

C) Slope –3, y–intercept 0 D) Slope $\frac{3}{2}$, y–intercept 0

Answer: B

The table below represents a linear function. Find the missing value in the table.

169)

x	0	1	2	3
f(x)	3	10	17	?

A) 27 B) 24 C) 25 D) 23

Answer: B

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170)

x	−2	−1	0	1
f(x)	−6	−1	4	?

A) 10 B) 7 C) 11 D) 9

Answer: D

171)

x	−2	−1	0	1
f(x)	8	6	4	?

A) 2 B) 3 C) 5 D) 1

Answer: A

172)

x	−4	−2	0	2	4
f(x)	−16	−11	−6	−1	?

A) 3 B) 4 C) 6 D) −4

Answer: B

The table below represents a linear function. One value is missing in the table. Write the slope–intercept form of f.

173)

x	0	1	2	3
f(x)	2	7	12	?

A) $f(x) = 5x + 2$ B) $f(x) = 6x + 2$ C) $f(x) = 4x + 4$ D) $f(x) = 2x + 9$

Answer: A

174)

x	−2	−1	0	1
f(x)	−9	−4	1	?

A) $f(x) = 2x + 11$ B) $f(x) = 4x + 7$ C) $f(x) = 5x + 1$ D) $f(x) = 6x + 0$

Answer: C

175)

x	−4	−2	0	2	4
f(x)	−16	−11	−6	−1	?

A) $f(x) = \frac{5}{2}x - 6$ B) $f(x) = \frac{5}{2}x + 6$ C) $f(x) = \frac{7}{2}x$ D) $f(x) = \frac{7}{2}x - 9$

Answer: A

176)

x	−2	0	4
f(x)	23	13	?

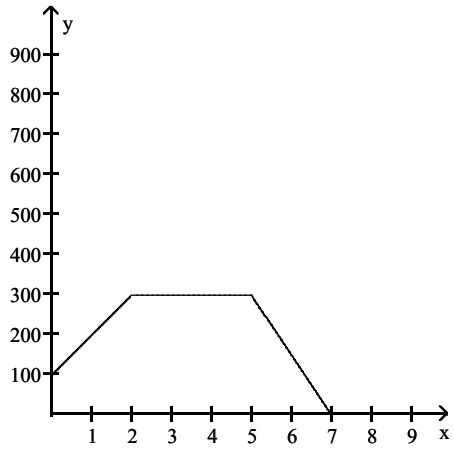
A) $f(x) = -6x + 26$ B) $f(x) = -10x + 39$ C) $f(x) = 5x - 26$ D) $f(x) = -5x + 13$

Answer: D

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Use the line graph to solve the problem.

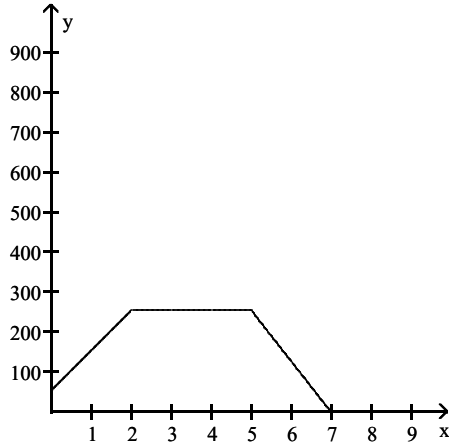
177) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of the line segment from (0, 98) to (2, 298). Interpret this slope as a rate of change.



A) m = 50; The pump is adding water at a rate of 50 gallons per hour.
B) m = 200; The pump is adding water at a rate of 200 gallons per hour.
C) m = –200; The pump is removing water at a rate of 200 gallons per hour.
D) m = 100; The pump is adding water at a rate of 100 gallons per hour.

Answer: D

178) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of the line segment from (2, 255) to (5, 255). Interpret this slope as a rate of change.

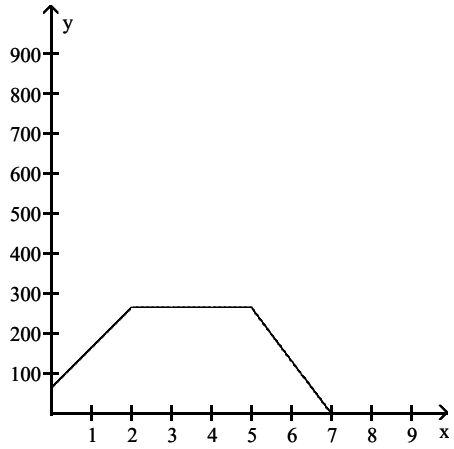


A) m = 0; The pump is neither adding nor removing water.
B) m = 1; The pump is adding water at a rate of 1 gallon per hour.
C) m = 0; The pump is removing water at a rate of 1 gallon per hour.
D) m = –1; The pump is removing water at a rate of 1 gallon per hour.

Answer: A

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179) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of the line segment from (5, 265) to (7, 0). Interpret this slope as a rate of change.



A) $m = -\frac{365}{2}$; The pump is removing water at a rate of $\frac{365}{2}$ gallons per hour.

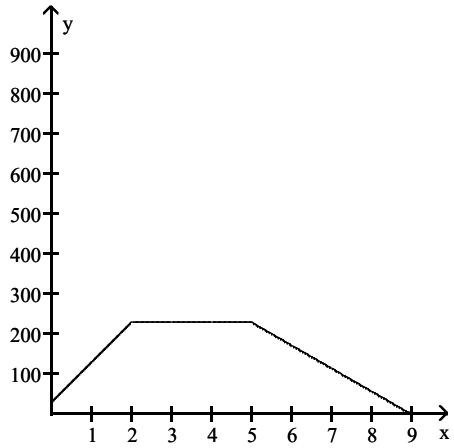
B) $m = 0$; The pump is neither adding nor removing water.

C) $m = \frac{265}{2}$; The pump is adding water at a rate of $\frac{265}{2}$ gallons per hour.

D) $m = -\frac{265}{2}$; The pump is removing water at a rate of $\frac{265}{2}$ gallons per hour.

Answer: D

180) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of the line segment from (5, 230) to (9, 0). Interpret this slope as a rate of change.



A) $m = \frac{115}{2}$; The pump is adding water at a rate of $\frac{115}{2}$ gallons per hour.

B) $m = -115$; The pump is removing water at a rate of 115 gallons per hour.

C) $m = -\frac{115}{2}$; The pump is removing water at a rate of $\frac{115}{2}$ gallons per hour.

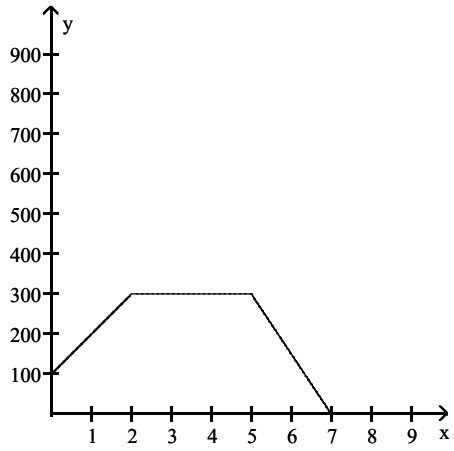
D) $m = 115$; The pump is adding water at a rate of 115 gallons per hour.

Answer: C

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Solve the problem.

181) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of each line segment, and interpret each slope as a rate of change. Describe what happens to the amount of water in the pool.



A) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 100 gallons per hour for three hours until there are 300 gallons of water in the pool. For the next two hours the amount of water does not change. Then the pump removes water at a rate of 150 gallons per hour for three hours, at which time the pool is empty.

B) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 50 gallons per hour for two hours until there are 300 gallons of water in the pool. For the next three hours the amount of water does not change. Then the pump removes water at a rate of 200 gallons per hour for two hours, at which time the pool contains 100 gallons of water.

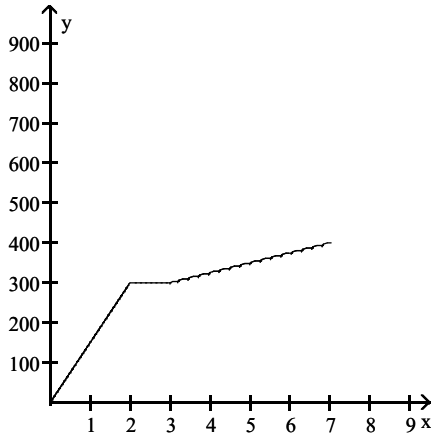
C) Initially the pool is empty. The pump adds water at a rate of 200 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next three hours the amount of water does not change. Then the pump removes water at a rate of 150 gallons per hour for two hours, at which time the pool is empty.

D) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 100 gallons per hour for two hours until there are 300 gallons of water in the pool. For the next three hours the amount of water does not change. Then the pump removes water at a rate of 150 gallons per hour for two hours, at which time the pool is empty.

Answer: D

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182) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of each line segment, and interpret each slope as a rate of change. Describe what happens to the amount of water in the pool.



A) Initially the pool contains 100 gallons of water.. The pump adds water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the amount of water does not change. Then the pump adds water at a rate of 25 gallons per hour for two hours, at which time the pool contains 400 gallons of water.

B) Initially the pool is empty. The pump adds water at a rate of 150 gallons per hour for two hours until there are 300 gallons of water in the pool. For the next hour the amount of water does not change. Then the pump adds water at a rate of 25 gallons per hour for four hours, at which time the pool contains 400 gallons of water.

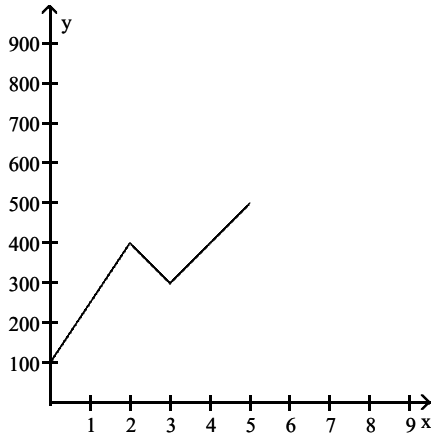
C) Initially the pool is empty. The pump adds water at a rate of 150 gallons per hour for two hours until there are 300 gallons of water in the pool. For the next hour the amount of water does not change. Then the pump removes water at a rate of 25 gallons per hour for four hours, at which time the pool is empty.

D) Initially the pool is empty. The pump adds water at a rate of 300 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the amount of water does not change. Then the pump adds water at a rate of 100 gallons per hour for four hours, at which time the pool contains 700 gallons of water.

Answer: B

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183) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of each line segment, and interpret each slope as a rate of change. Describe what happens to the amount of water in the pool.



A) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the pump neither adds nor removes water. Then the pump adds water at a rate of 100 gallons per hour for two hours, at which time the pool contains 500 gallons of water.

B) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the pump removes water at a rate of 100 gallons per hour. Then the pump adds water at a rate of 100 gallons per hour for two hours, at which time the pool contains 500 gallons of water.

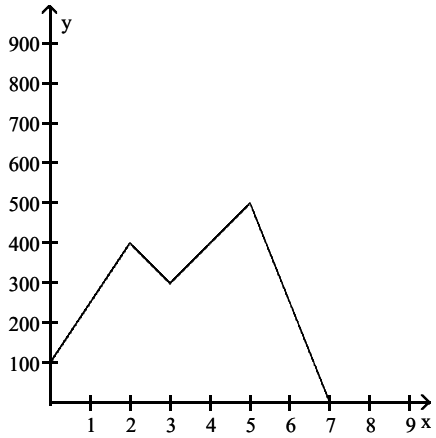
C) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 300 gallons per hour for two hours until there are 700 gallons of water in the pool. For the next hour the pump removes water at a rate of 100 gallons per hour. Then the pump adds water at a rate of 200 gallons per hour for two hours, at which time the pool contains 600 gallons of water.

D) Initially the pool contains is empty. The pump adds water at a rate of 150 gallons per hour for two hours until there are 300 gallons of water in the pool. For the next hour the pump removes water at a rate of 100 gallons per hour. Then the pump adds water at a rate of 100 gallons per hour for two hours, at which time the pool contains 400 gallons of water.

Answer: B

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184) The line graph represents the gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of each line segment, and interpret each slope as a rate of change. Describe what happens to the amount of water in the pool.



A) Initially the pool contains 1000 gallons of water. The pump removes water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the pump adds water at a rate of 100 gallons per hour. Then the pump removes water at a rate of 100 gallons per hour for two hours. Finally, the pump adds water at a rate of 250 gallons per hour for 2 hours, at which time the pool contains 900 gallons of water.

B) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 300 gallons per hour for one hour until there are 400 gallons of water in the pool. For the next hour the pump removes water at a rate of 50 gallons per hour. Then the pump adds water at a rate of 150 gallons per hour for two hours. Finally, the pump removes water at a rate of 150 gallons per hour for 2 hours, at which time the pool is empty.

C) Initially the pool contains 200 gallons of water. The pump adds water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the pump neither adds nor removes water. Then the pump adds water at a rate of 100 gallons per hour for one hour. Finally, the pump removes water at a rate of 250 gallons per hour for 3 hours, at which time the pool is empty.

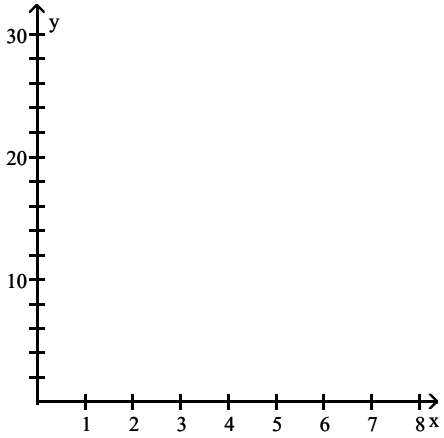
D) Initially the pool contains 100 gallons of water. The pump adds water at a rate of 150 gallons per hour for two hours until there are 400 gallons of water in the pool. For the next hour the pump removes water at a rate of 100 gallons per hour. Then the pump adds water at a rate of 100 gallons per hour for two hours. Finally, the pump removes water at a rate of 250 gallons per hour for 2 hours, at which time the pool is empty.

Answer: D

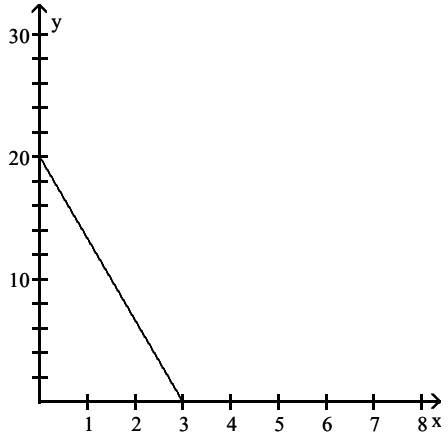
Sketch a graph that models the given situation.

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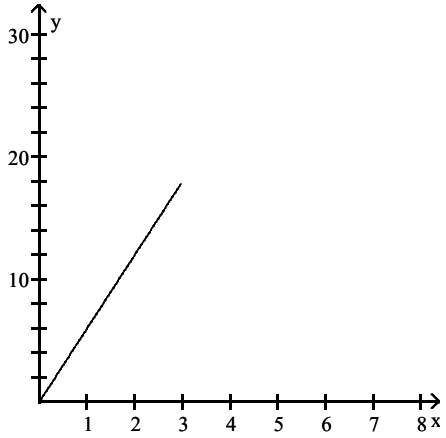
185) The distance that a bicycle rider is from his home if he is initially 18 miles away from home and arrives home after riding at a constant speed for 3 hours.



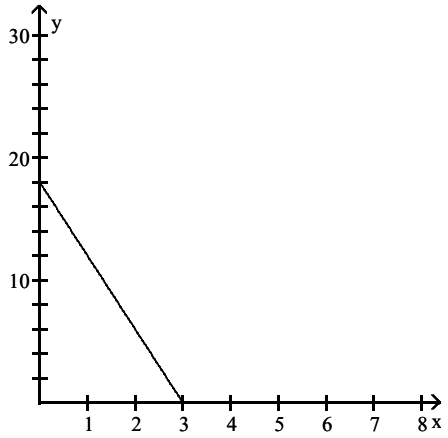
A)



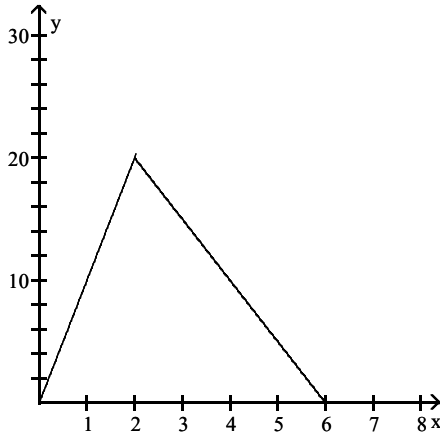
B)



C)



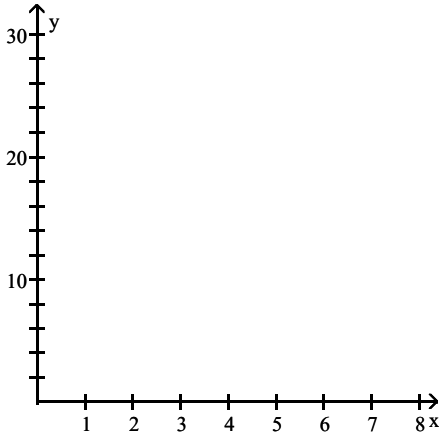
D)



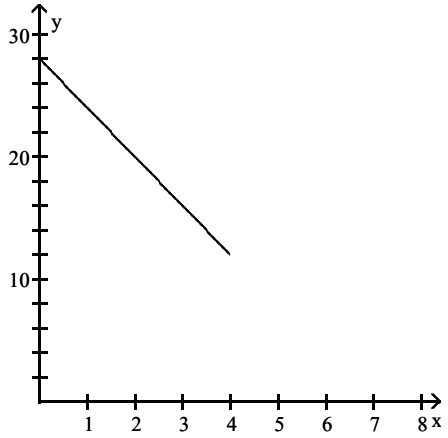
Answer: C

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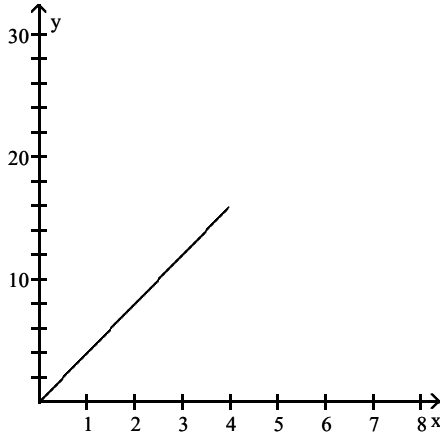
186) The distance that a bicycle rider is from his home if he is initially at home and then rides to a point 28 miles away from home after riding at a constant speed for 4 hours.



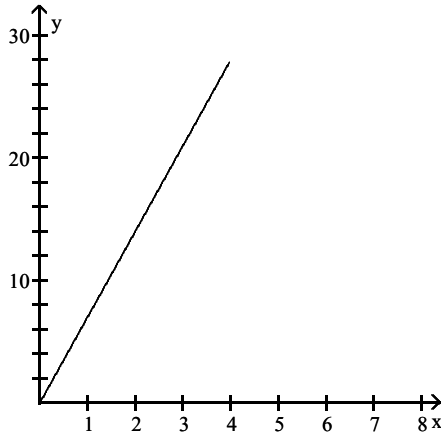
A)



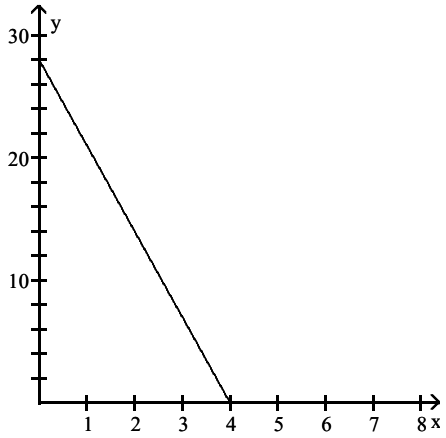
B)



C)



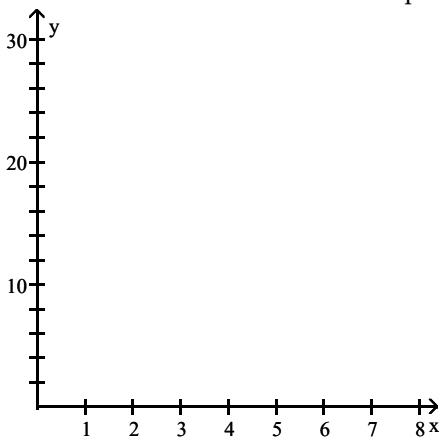
D)



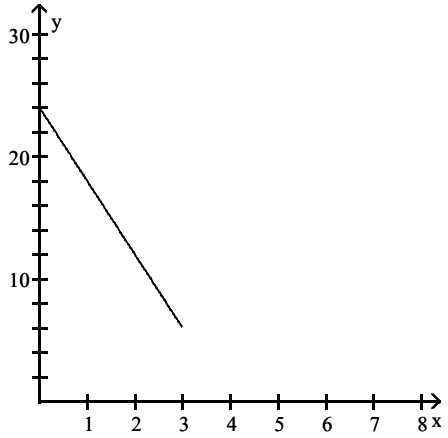
Answer: C

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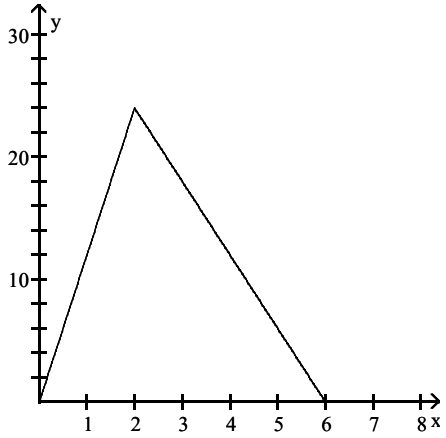
187) The distance that a bicycle rider is from his home if he rides away from home at 12 miles per hour for 2 hours and then rides back home at 6 miles per hour.



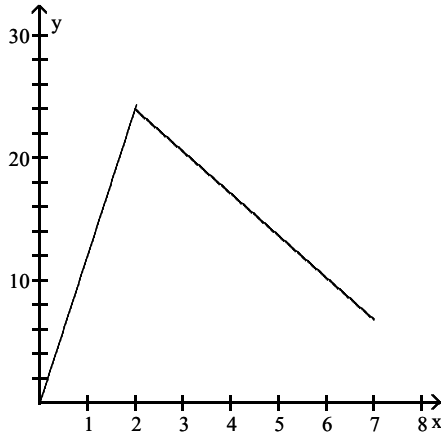
A)



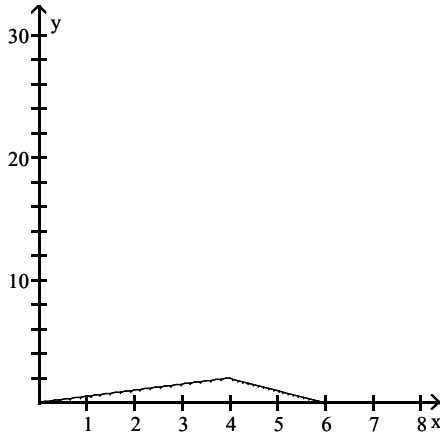
B)



C)



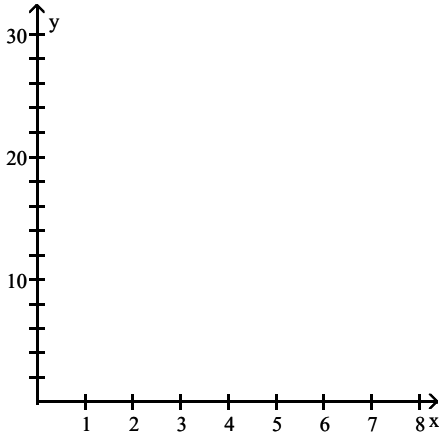
D)



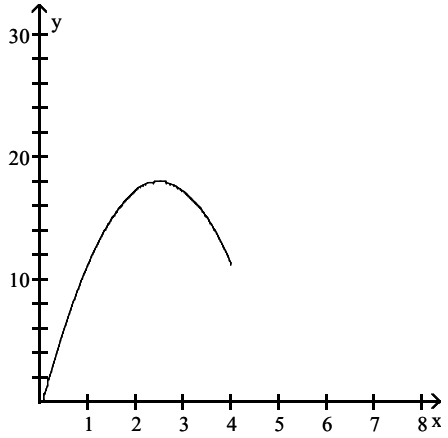
Answer: B

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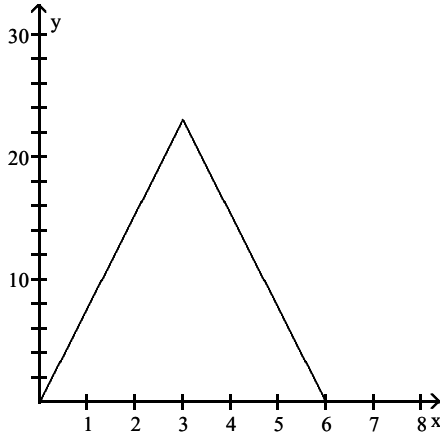
188) The distance that a person is from his home if he drives to a grocery store, stays 4 hours, and then drives home, if the distance to the store is 23 miles and the trip takes 1 hour each way.



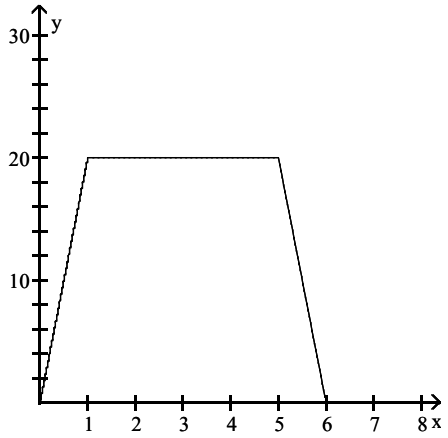
A)



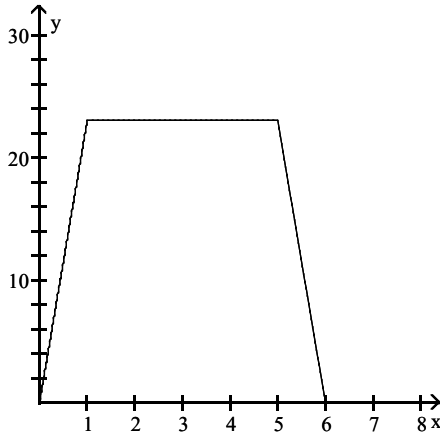
B)



C)



D)



Answer: D

Solve the problem.

189) Computer Incorporated sells computer systems. The company profit is given by the function f(x) = 140x – 3900, where x is the number of computer systems sold. What is the slope of the graph of f?

A) 140 B) 3900 C) –140 D) –3900

Answer: A

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190) Computer Incorporated sells computer systems. The company profit is given by the function f(x) = 137x – 2000, for x ≥ 20, where x is the number of computer systems sold. Interpret the slope of the graph of f as a rate of change.

A) The company profit increases by $142 for each computer system that is sold.
B) The company profit increases by $137 for each computer system that is sold.
C) The company profit increases by $100 for each computer system that is sold.
D) The company profit decreases by $142 for each computer system that is sold.

Answer: B

191) The value, in dollars, of a copy machine is given by the function f(x) = –420x + 6000, where x is the number of years that have passed since the machine was purchased. Interpret the slope of the graph of f as a rate of change.

A) The copy machine increases in value by $210 each year.
B) The copy machine increases in value by $420 each year.
C) The copy machine decreases in value by $420 each year.
D) The copy machine decreases in value by $210 each year.

Answer: C

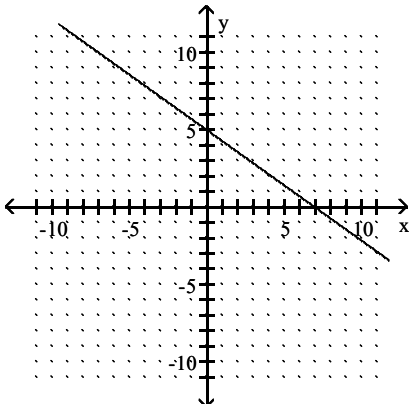
192) The value, in dollars, of a copy machine is given by the function f(x) = –390x + 781,500, where x is the year and 2002 ≤ x ≤ 2012. What was the value of the copy machine in 2008?

A) $–2400 B) $–2010 C) $–1620 D) $–1230

Answer: C

Find a point on the line and its slope and use these values to write the slope–intercept form of the line.

193)

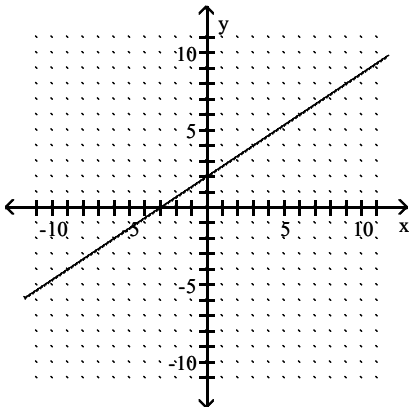


A) y = 7x + 5 B) $y = -\frac{5}{7}x + 5$ C) $y = -\frac{7}{5}x + 7$ D) y = –7x + 5

Answer: B

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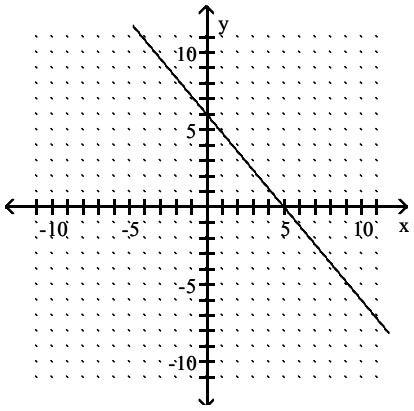
194)



A) $y = \frac{2}{3}x + 2$ B) $y = -3x + 2$ C) $y = 3x + 2$ D) $y = \frac{3}{2}x - 3$

Answer: A

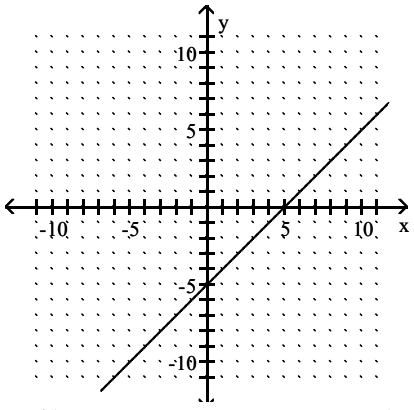
195)



A) $y = -5x + 6$ B) $y = -\frac{5}{6}x + 5$ C) $y = 5x + 6$ D) $y = -\frac{6}{5}x + 6$

Answer: D

196)

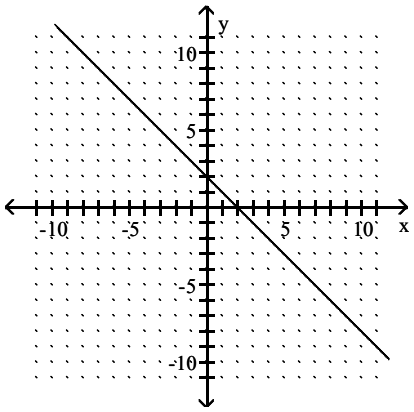


A) $y = -x + 5$ B) $y = -x - 5$ C) $y = x + 5$ D) $y = x - 5$

Answer: D

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197)



A) $y = x - 2$ B) $y = x + 2$ C) $y = -x - 2$ D) $y = -x + 2$

Answer: D

Determine whether the given point lies on the line.

198) $(-12, 0)$, $y = -\frac{2}{3}x + 3$

A) Yes B) No

Answer: B

199) $(4, -4)$, $y = -(x + 3) + 3$

A) Yes B) No

Answer: A

200) $(3, -2)$, $y = -5(x + 3) + 4$

A) Yes B) No

Answer: B

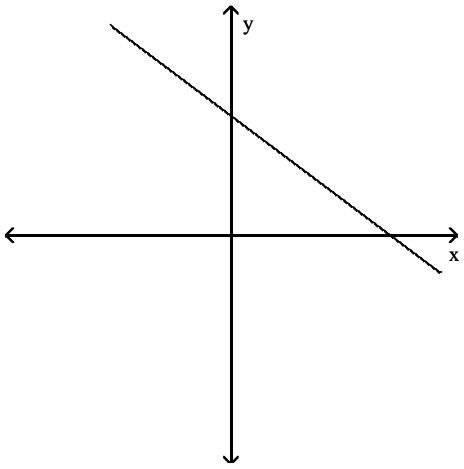
201) $(-3, 1)$, $y = -6(x + 3) + 1$

A) Yes B) No

Answer: A

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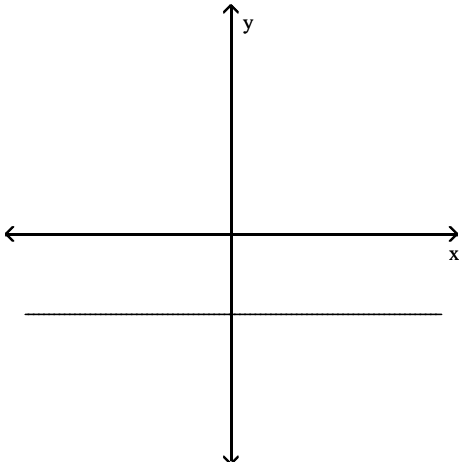
Match the graph with its correct equation (m and b are constants).



202)

A) $y = mx + b$, $m > 0$ and $b > 0$
B) $y = mx$, $m < 0$
C) $y = mx + b$, $m < 1$ and $b > 0$
D) $y = mx + b$, $m < 0$ and $b > 0$

Answer: D

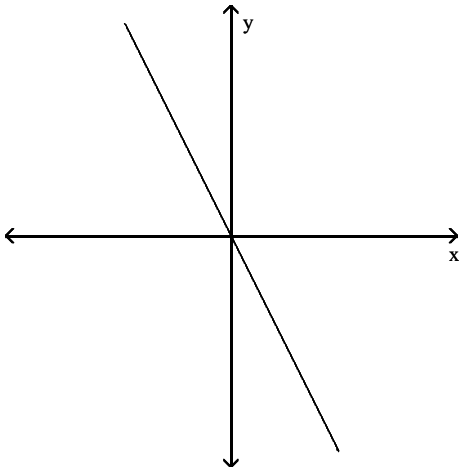


203)

A) $y = b$, $b > 0$
B) $y = mx + b$, $m > 0$ and $b > 0$
C) $y = b$, $b < 0$
D) $x = h$, $h < 0$

Answer: C

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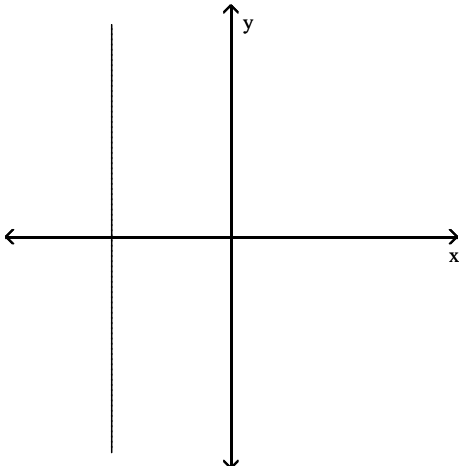


204)

A) $y = mx, m < 0$ B) $y = mx, m > 0$

C) $y = b, \ b < 0$ D) $y = mx + b, m < 0$ and $b > 0$

Answer: A



205)

A) $y = mx, m > 0$ B) $y = mx + b, m < 0$ and $b > 0$

C) $x = h, h < 0$ D) $y = b, \ b < 0$

Answer: C

Find a point–slope form for the equation of the line satisfying the conditions.

206) Slope –2, passing through (6, 4)

A) $y = -2(x - 6) - 4$ B) $y - 4 = -2x + 6$ C) $y - 4 = 2x - 6$ D) $y = -2(x - 6) + 4$

Answer: D

207) Slope –7, passing through (–6, –4)

A) $y = -7(x + 6) - 4$ B) $y = 7(x - 6) + 4$ C) $y + 4 = 7x + 6$ D) $y = -7(x - 6) + 4$

Answer: A

208) Passing through (9, –9) and (8, –6)

A) $y = 3(x + 9) + 9$ B) $y = -3(x - 9) - 9$ C) $y = 9(x - 3) - 9$ D) $y = -9(x + 3) + 9$

Answer: B

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Write the equation in slope–intercept form.

209) $y = 2(x - 6) - 2$

A) $y = 2x + 14$ B) $y = -2x + 12$ C) $y = 3x - 16$ D) $y = 2x - 14$

Answer: D

210) $y = \frac{1}{2}(x - 4) - 3$

A) $y = \frac{1}{2}x - 5$ B) $y = 2x - 6$ C) $y = -\frac{1}{2}x + 5$ D) $\frac{1}{2}x + y = 8$

Answer: A

211) $y = -\frac{2}{3}(x - 27) + 6$

A) $y = \frac{3}{2}x - 24$ B) $y = -\frac{2}{3}x + 24$ C) $y = -\frac{2}{3}x + 12$ D) $y = -\frac{1}{3}x + 28$

Answer: B

212) $y = 32(x - 3.5) - 8$

A) $y = -32x - 123$ B) $y = 30x - 64$ C) $y = 32x - 120$ D) $y = 32x - 104$

Answer: C

Use the slope–intercept form to find the equation of the line passing through the given points.

213) (–6, 19), (5, –3)

A) $y = 2x + 7$ B) $y = 2x - 7$ C) $y = -2x - 7$ D) $y = -2x + 7$

Answer: D

214) (10, 1), (–10, –11)

A) $y = \frac{3}{5}x + 5$ B) $y = \frac{3}{5}x - 5$ C) $y = \frac{5}{3}x - 5$ D) $y = \frac{5}{3}x + 5$

Answer: B

215) (2, 0), (4, –5)

A) $y = -\frac{5}{2}x + 5$ B) $y = \frac{5}{2}x$ C) $y = -\frac{5}{2}x$ D) $y = \frac{5}{2}x + 5$

Answer: A

216) (–5, 7), (–2, –7)

A) $x = -\frac{14}{3}y - \frac{49}{3}$ B) $y = \frac{14}{3}x - \frac{49}{3}$ C) $x = \frac{14}{3}y - \frac{49}{3}$ D) $y = -\frac{14}{3}x - \frac{49}{3}$

Answer: D

Find the slope–intercept form for the line that satisfies the stated conditions.

217) Slope $\frac{4}{5}$, passing through (0, –5)

A) $y = -\frac{5}{4}x - 5$ B) $y = \frac{4}{5}x - 5$ C) $y = \frac{4}{5}x + 5$ D) $y = -\frac{5}{4}x + 5$

Answer: B

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218) Slope 4, passing through (–4, –2)

A) $y = 4x + 14$ B) $y + 2 = mx + 4$ C) $y + 2 = x + 4$ D) $y = 4x - 14$

Answer: A

219) Slope $-\frac{4}{5}$, passing through (3, 2)

A) $y = \frac{4}{5}x + \frac{22}{5}$ B) $y = -\frac{4}{5}x + \frac{22}{5}$ C) $y = -\frac{4}{5}x - \frac{22}{5}$ D) $y = \frac{4}{5}x - \frac{22}{5}$

Answer: B

220) Passing through (3, 2) and (–5, 2)

A) $y = -8x - 2$ B) $x = 2$ C) $y = 2$ D) $y = 8x + 2$

Answer: C

221) x–intercept 4, y–intercept $-\frac{2}{5}$

A) $y = \frac{1}{10}x - \frac{2}{5}$ B) $y = 40x - 2$ C) $y = \frac{1}{40}x - \frac{2}{5}$ D) $y = -\frac{3}{20}x - \frac{2}{5}$

Answer: A

222) Passing through (0, –6), parallel to $y = 5x - 3$,

A) $y = -5x - 6$ B) $y = 5x + 18$ C) $y = 5x - 6$ D) $y = -\frac{1}{5}x - 6$

Answer: C

223) Passing through (2, 1), parallel to $y = 2x - 4$

A) $y = 2x - 3$ B) $y = -2x - 3$ C) $y = 2x + 1$ D) $y = 2x + 5$

Answer: A

224) Passing through (–3, –4), perpendicular to $y = 4x - 3$

A) $y = \frac{1}{4}x - \frac{19}{4}$ B) $y = -\frac{1}{4}x - \frac{19}{4}$ C) $y = -4x - \frac{19}{4}$ D) $y = 4x - \frac{19}{4}$

Answer: B

225) Passing through (4, –1), perpendicular to $y = \frac{2}{5}(x - 3) + 1$

A) $y = -10x + 14$ B) $y = -\frac{2}{5}x + 11$ C) $y = -\frac{5}{2}x + 9$ D) $y = \frac{5}{2}x - 9$

Answer: C

226) Passing through (–6, –4) and parallel to the line passing through (–4, –5) and (4, –1).

A) $y = 2x + 1$ B) $y = \frac{1}{2}x - 1$ C) $y = \frac{1}{2}x + 1$ D) $y = 2x - 1$

Answer: B

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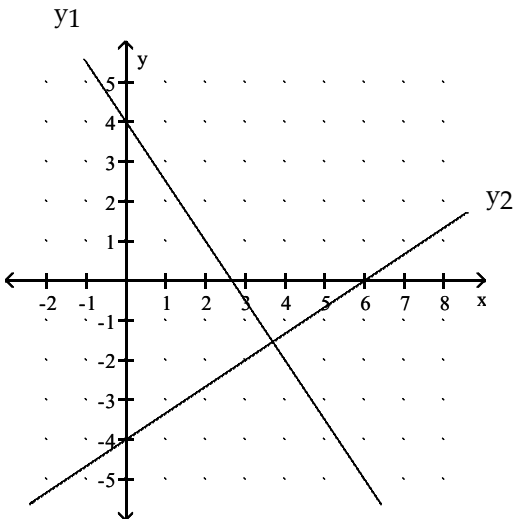
227) Passing through (5, –4) and perpendicular to the line passing through $\left(9, \frac{49}{4}\right)$ and $(-4, -4)$.

A) $y = \frac{5}{4}x - 9$ B) $y = -\frac{4}{5}x + 9$ C) $y = -\frac{4}{5}x$ D) $y = -\frac{5}{4}x$

Answer: C

Find the slope of each line and verify that the lines are perpendicular.

228)

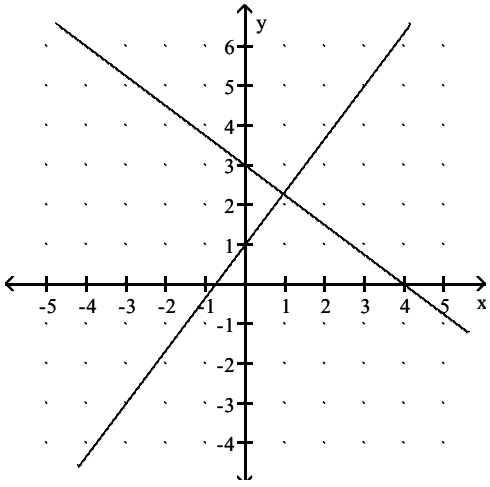


A) $m_1 = -\frac{3}{2}; m_2 = \frac{3}{2}; m_1 + m_2 = 0$ B) $m_1 = \frac{3}{2}; m_2 = -\frac{2}{3}; m_1 \cdot m_2 = -1$

C) $m_1 = -\frac{3}{2}; m_2 = \frac{2}{3}; m_1 \cdot m_2 = -1$ D) $m_1 = \frac{3}{2}; m_2 = \frac{2}{3}; m_1 \cdot m_2 = 1$

Answer: C

229)



A) $m_1 = -\frac{3}{4}; m_2 = \frac{4}{3}; m_1 \cdot m_2 = -1$ B) $m_1 = \frac{3}{4}; m_2 = \frac{4}{3}; m_1 \cdot m_2 = 1$

C) $m_1 = -\frac{3}{4}; m_2 = \frac{3}{4}; m_1 + m_2 = 0$ D) $m_1 = \frac{3}{4}; m_2 = -\frac{4}{3}; m_1 \cdot m_2 = -1$

Answer: A

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Find an equation of a line satisfying the given conditions.

230) Perpendicular to $x = -1$, passing through $(5, 8)$

A) $y = -1$ B) $x = -1$ C) $y = 8$ D) $y = -8$

Answer: C

231) Vertical, passing through $(8, 7)$

A) $y = 7$ B) $y = 8$ C) $x = 7$ D) $x = 8$

Answer: D

232) Vertical, passing through $(-1.24, 5.09)$

A) $x = -1.24$ B) $y = -1.24$ C) $y = 5.09$ D) $x = 5.09$

Answer: A

233) Horizontal, passing through $(-3, -7)$

A) $y = -7$ B) $y = -3$ C) $x = -7$ D) $x = -3$

Answer: A

234) Horizontal, passing through $(9.28, 0.72)$

A) $x = 9.28$ B) $y = 9.28$ C) $x = 0.72$ D) $y = 0.72$

Answer: D

Decide whether the points in the table lie on a line. If they do, find the slope–intercept form of the line.

235)

x	−3	−2	−1	0
y	3	1	0	−2

A) Yes; $y = -2x + 3$ B) Yes; $y = 3x$ C) Yes; $y = -3x + 3$ D) No

Answer: D

236)

x	−3	−2	−1	0
y	−27	−20	−13	−6

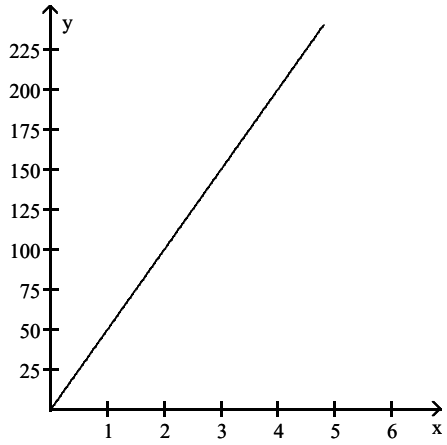
A) No B) Yes; $y = -3x - 27$ C) Yes; $y = -6x + 7$ D) Yes; $y = 7x - 6$

Answer: D

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Solve the problem.

237) A person is driving a car along a straight road. The graph shows the distance y in miles that the driver is from home after x hours.



The graph passes through the point (2, 100). What is the meaning of this point?

A) The driver has driven for 2 hours and must drive an additional 100 miles to complete the trip.
B) After 2 hours the driver is 100 miles from home.
C) It will take the driver 2 hours to complete the trip, which requires driving 100 additional miles.
D) After 100 hours, the driver is 2 miles from home.

Answer: B

238) Decide whether the points in the table lie on a line. If they do, find the slope–intercept form of the line.

x	–2	–1	0	1
f(x)	–7	–1	5	11

A) Yes; f(x) = 5x + 5 B) Yes; f(x) = 6x + 7 C) Yes; f(x) = 6x + 5 D) No

Answer: C

239) From 2005 to 2012, the number of automobile vehicle tags purchased in a certain city can be modeled by f(x) = 52(x – 2005) + 1078. Find the number of vehicle tags purchased in 2008.

A) 1334 B) 1234 C) 156 D) 12,340

Answer: B

240) The population of a certain city is shown in the table. Find the values for m, h, and k such that f(x) = m(x – h) + k models this data. Using the data for 1997 to determine the values.

Year	1997	2002	2007	2012
Population	3900	8400	12,900	17,400

A) m = 800, h = 1997, k = 3900 B) m = 900, h = 2007, k = 17,400
C) m = 900, h = 1997, k = 3900 D) m = 800, h = 2002, k = 8400

Answer: C

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

241) Explain how to apply the "Vertical Line Test". Give examples of its application.

Answer: The "Vertical Line Test" is used to determine whether a graph represents a function. You visualize vertical lines in the xy–plane, and if each vertical line intersects a graph no more than one time, then it is a graph of a function. The graph of f(x) = 4x passes the "Vertical Line Test."

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242) Define the word "function".

Answer: A function is a set of ordered pairs (x, y), in which each x–value corresponds to exactly one y–value.

243) Determine whether the wording "calculating the square of a number and then adding four to the result" is a representation of a function. Explain your answer.

Answer: Yes. The equivalent symbolic representation is "$y = x^2 + 4$", and the graph of this equation passes the Vertical Line Test.

244) Explain the relationship that exists between the slopes of lines that are perpendicular.

Answer: The product of the slopes is –1.

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