

TEST BANK



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

Find the slope of the line passing through the given pair of points.

1) (7, 3) and (8, 5) 1) _____
A) $\frac{8}{15}$ B) $\frac{1}{2}$ C) 2 D) -2

2) (-4, 1) and (-9, -3) 2) _____
A) $\frac{2}{13}$ B) $\frac{4}{5}$ C) $\frac{5}{4}$ D) $\frac{4}{5}$

3) (5, 9) and (5, -4) 3) _____
A) 0 B) $\frac{1}{2}$
C) $\frac{13}{10}$ D) Not defined

4) (-1, 1) and (4, 1) 4) _____
A) 0 B) $\frac{2}{5}$
C) $\frac{2}{3}$ D) Not defined

5) (19, 2) and (-1, -2) 5) _____
A) $\frac{1}{5}$ B) 5 C) $\frac{1}{5}$ D) 0

Find the slope of the line.

6) $y = \frac{7}{2}x$ 6) _____
A) 1 B) $\frac{2}{7}$ C) 0 D) $\frac{7}{2}$

7) $y = 3x - 7$ 7) _____
A) 0 B) 1 C) 3 D) -3

8) $2x + 5y = -38$ 8) _____
A) $\frac{5}{2}$ B) $\frac{38}{5}$ C) $\frac{2}{5}$ D) $\frac{2}{5}$

9) $4x - 2y = 28$ 9) _____
A) -14 B) 2 C) $\frac{1}{2}$ D) -2

10) The x-axis 10) _____
A) Not defined B) 1
C) 0 D) -1

11) $x = -10$ 11) _____

- A) Not defined
C) -10

- B) 1
D) 0

12) A line parallel to $-2y + 3x = -6$

- A) $\frac{3}{2}$ B) $\frac{2}{3}$

C) -2

- D) $\frac{3}{2}$

12) _____

13) A line parallel to $-4x = 3y + 13$

- A) $\frac{4}{3}$ B) $\frac{3}{4}$

C) $\frac{4}{3}$

- D) $\frac{13}{4}$

13) _____

14) A line perpendicular to $-4x + 7y = -6$

- A) $\frac{4}{7}$ B) $\frac{7}{4}$

C) -4

- D) $\frac{7}{4}$

14) _____

15) A line perpendicular to $4x = 2y - 8$

- A) -4 B) $\frac{1}{2}$

C) $\frac{1}{2}$

- D) -2

15) _____

Find an equation in slope-intercept form (where possible) for the line.

16) Through $(0, 4)$, $m = \frac{1}{2}$

Through $(0, 4)$, $m =$

- A) $y = -\frac{1}{2}x + 4$

- B) $y = \frac{1}{2}x + 4$

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

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

16) _____

17) Through $(-13, 5)$, $m = -2$

- A) $y = -2x - 21$

- B) $y = 2x + 21$

- C) $y = 2x - 3$

- D) $y = -2x + 5$

17) _____

18) Through $(3, 0)$, $m = -1$

- A) $y = x - 3$

- B) $y = 3x$

- C) $y = -3x$

- D) $y = -x + 3$

18) _____

19) Through $(3, -4)$, $m = -2$

- A) $y = -2x - 10$

- B) $y = -2x + 2$

- C) $y = 2x - 10$

- D) $y = 2x + 2$

19) _____

20) Through $(-7, 8)$, $m = 0$

- A) $x = -7$ B) $y = 8$

- C) $y = \frac{7}{8}x$

- D) $y = \frac{8}{7}x$

20) _____

21) Through $(-9, -2)$, with undefined slope

- A) $\frac{2}{9}x - 9y = 0$

- B) $-\frac{9}{2}x - 2y = 0$

- C) $x = -9$

- D) $y = -2$

21) _____

22)

Through $(3, 3)$, $m =$

$\frac{2}{3}$

22)

A) $y = \frac{2}{3}x - 5$

C) $y = -\frac{2}{3}x + 5$

B) $y = \frac{2}{3}x + 2$

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

23)

Through (0, -2), m = $\frac{7}{2}$

A) $y = \frac{7}{2}x - 2$

C) $y = -\frac{7}{2}x + 2$

B) $y = \frac{7}{2}x + 2$

D) $y = -\frac{7}{2}x - 2$

23) _____

24)

Through (4, 2), m = $-\frac{4}{9}$

A) $y = \frac{4}{9}x + \frac{16}{9}$

C) $y = -\frac{4}{9}x + \frac{34}{9}$

B) $y = \frac{4}{9}x - \frac{34}{9}$

D) $y = -\frac{4}{9}x + \frac{16}{9}$

24) _____

25) Through (-3, -6), m = 1.5

A) $y = 1.5x - 10.5$

C) $y = -1.5x - 10.5$

B) $y = -1.5x - 1.5$

D) $y = 1.5x - 1.5$

25) _____

26) Through (1, 4) and (5, -5)

A) $y = -\frac{9}{4}x + \frac{25}{4}$

C) $y = \frac{9}{4}x + \frac{7}{4}$

B) $y = -\frac{9}{4}x + \frac{32}{9}$

D) $y = -\frac{4}{9}x + \frac{40}{9}$

26) _____

27) Through (-7, 5) and (0, -3)

A) $y = -4x - 3$

C) $y = \frac{8}{7}x - 3$

B) $y = -\frac{8}{7}x - 3$

D) $y = 4x - 3$

27) _____

28) Through (-6, 0) and (-2, 3)

A) $y = \frac{3}{4}x + \frac{9}{2}$

C) $y = -\frac{3}{4}x + \frac{9}{2}$

B) $y = \frac{6}{5}x + \frac{27}{5}$

D) $y = -\frac{6}{5}x + \frac{27}{5}$

28) _____

29) Through (-7, 5) and (-4, 0)

A) $y = -3x + 12$

C) $y = \frac{5}{3}x - \frac{20}{3}$

B) $y = 3x + 12$

D) $y = -\frac{5}{3}x - \frac{20}{3}$

29) _____

- 30) Through $(-8, -3)$ and $(-3, 4)$ 30) _____
- A) $y = \frac{5}{7}x + \frac{43}{7}$ B) $y = \frac{7}{5}x + \frac{41}{5}$
- C) $y = \frac{5}{7}x + \frac{43}{7}$ D) $y = \frac{7}{5}x + \frac{41}{5}$
- 31) Through $(3, 1.5)$ and $(7, 3.5)$ 31) _____
- A) $y = 0.5x + 0$ B) $y = -0.5x + 3$
- C) $y = 2x - 4.5$ D) $y = -2x + 7.5$
- 32) Through $(10, 9)$ and $(10, -8)$ 32) _____
- A) $y = 9$ B) $\frac{8}{9}x + 9y = 0$
- C) $\frac{9}{8}x - 8y = 0$ D) $x = 10$
- 33) Through $(-1, 1)$ and $(-2, 1)$ 33) _____
- A) $\frac{1}{2}x - 2y = 0$ B) $-2x - 1y = 0$
- C) $y = 1$ D) $x = -1$
- 34) y-intercept -3 , x-intercept -8 34) _____
- A) $y = -\frac{8}{3}x - 8$ B) $y = -\frac{3}{8}x - 3$
- C) $y = \frac{8}{3}x - 8$ D) $y = \frac{3}{8}x - 3$
- 35) Through $(-9, -1)$, perpendicular to $9x + 5y = -86$ 35) _____
- A) $y = -\frac{5}{9}x - 4$ B) $y = \frac{5}{9}x + 4$
- C) $y = \frac{5}{9}x$ D) $y = \frac{9}{5}x - 36$
- 36) Through $(-2, 11)$, parallel to $-4x + 7y = 22$ 36) _____
- A) $y = \frac{2}{7}x + \frac{22}{7}$ B) $y = \frac{4}{7}x + \frac{85}{7}$
- C) $y = \frac{7}{4}x - \frac{11}{4}$ D) $y = -\frac{4}{7}x - \frac{85}{7}$
- 37) Through $(-7, -3)$, parallel to $-3x - 8y = 53$ 37) _____
- A) $y = -\frac{8}{3}x + 1$ B) $y = \frac{3}{8}x + \frac{45}{8}$
- C) $y = \frac{7}{8}x - \frac{53}{8}$ D) $y = -\frac{3}{8}x - \frac{45}{8}$
- 38) Through $(-5, 9)$, perpendicular to $5x - 2y = -7$ 38) _____
- A) _____

$$= -\frac{5}{2}x - \frac{5}{2}$$

B) $y = \frac{5}{2}x - \frac{7}{2}$

C) $y = \frac{2}{5}x + 7$

D) $y = -\frac{2}{5}x + 7$

39) Through (3, 6), perpendicular to $7x + 3y = 39$ 39) _____

A) $y = \frac{3}{7}x$

B) $y = \frac{7}{3}x - 33$

C) $y = \frac{3}{7}x + \frac{33}{7}$

D) $y = -\frac{3}{7}x - \frac{33}{7}$

40) Through (-7, 4), perpendicular to $x = -5$ 40) _____

A) $y = -5$

B) $x = -5$

C) $y = 4$

D) $y = -4$

41) The line with y-intercept 1 and perpendicular to $x + 5y = 8$ 41) _____

A) $y = 5x + 1$

B) $y = \frac{1}{5}x + 1$

C) $y = -5x + 1$

D) $y = -\frac{1}{5}x + 1$

42) The line with x-intercept 1 and perpendicular to $4x - y = 9$ 42) _____

A) $y = -\frac{1}{4}x + 1$

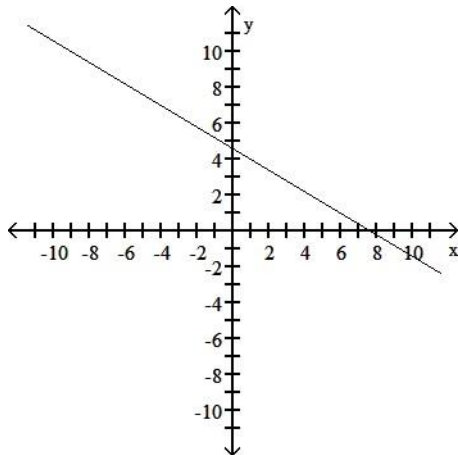
B) $y = -\frac{1}{4}x + \frac{1}{4}$

C) $y = -4x + 4$

D) $y = \frac{1}{4}x + \frac{1}{4}$

Find the slope of the line.

43)



43) _____

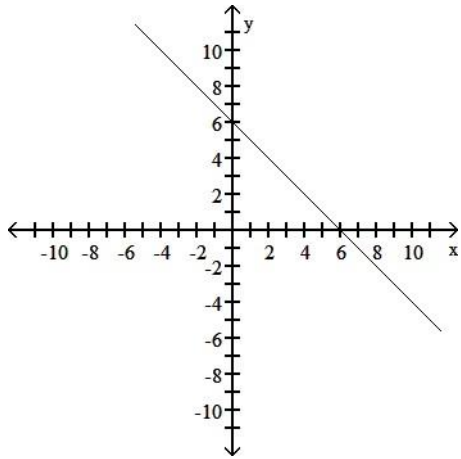
A) $\frac{5}{3}$

B) $\frac{3}{5}$

C) $\frac{5}{3}$

D) $\frac{3}{5}$

44)



A) 1

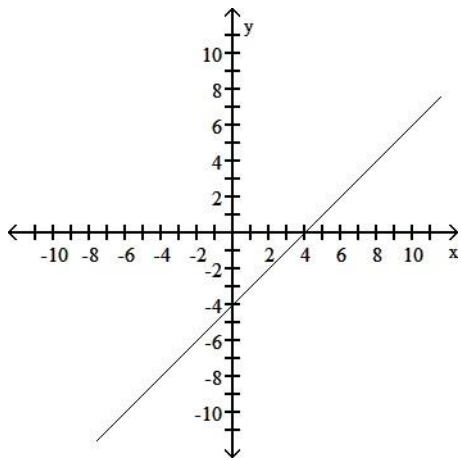
B) -6

C) 6

D) -1

44) _____

45)



A) 1

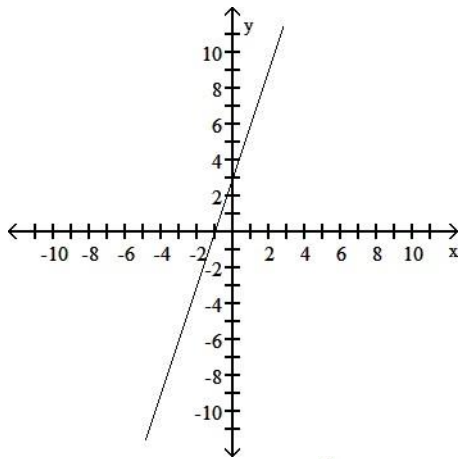
B) -1

C) 4

D) -4

45) _____

46)



A) - 3

B) $\frac{1}{3}$

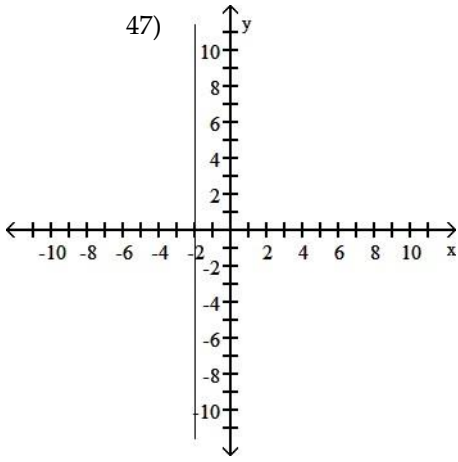
C) 3

D) $\frac{1}{3}$

46) _____

47)

47)



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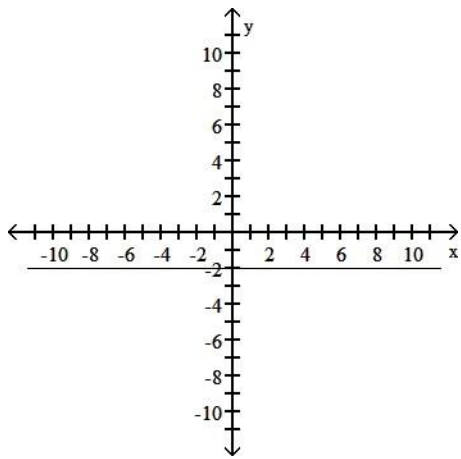
A) undefined

B) $\frac{3}{2}$

C) -2

D) 0

48)



48) _____

A) 0

B) undefined

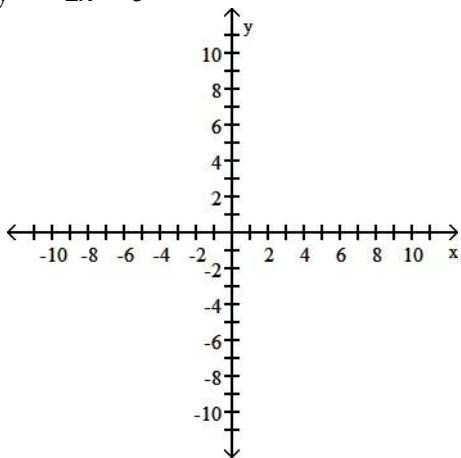
C) 2

D) -2

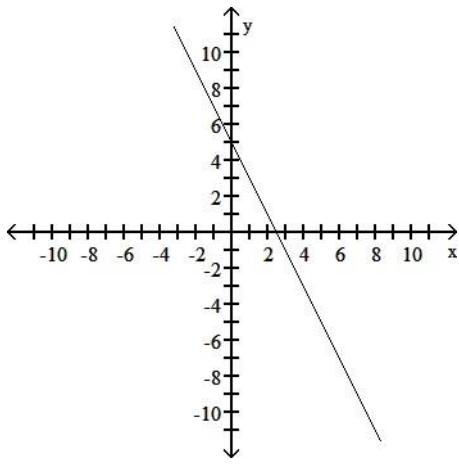
Graph the equation.

49) $y = -2x - 5$

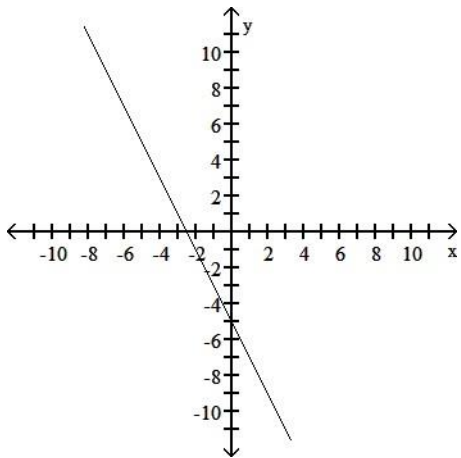
49) _____



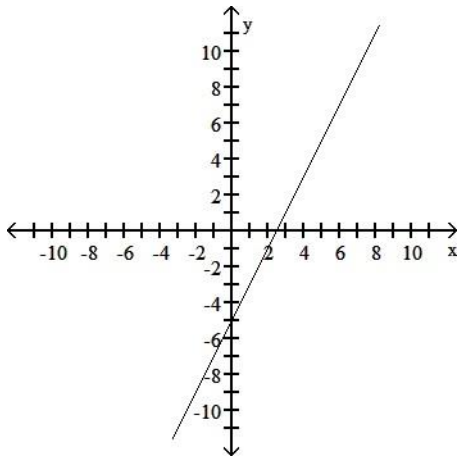
A)



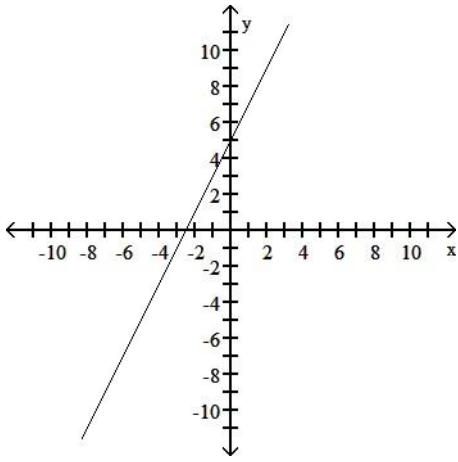
B)



C)

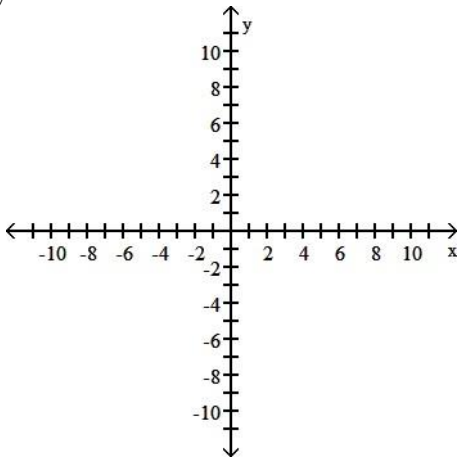


D)

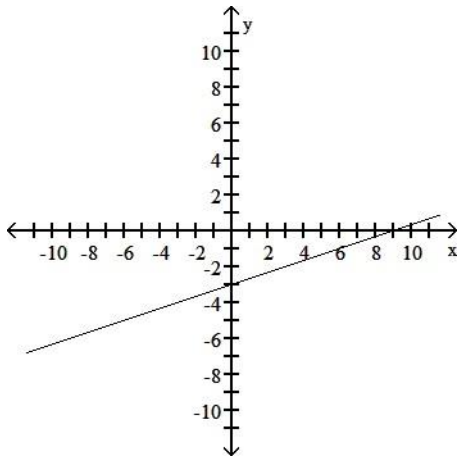


50) $y = -\frac{1}{3}x - 3$

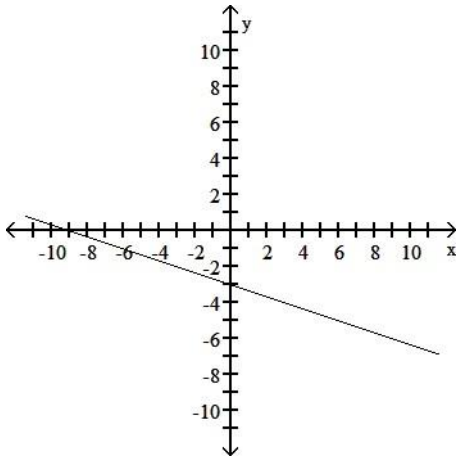
50) _____



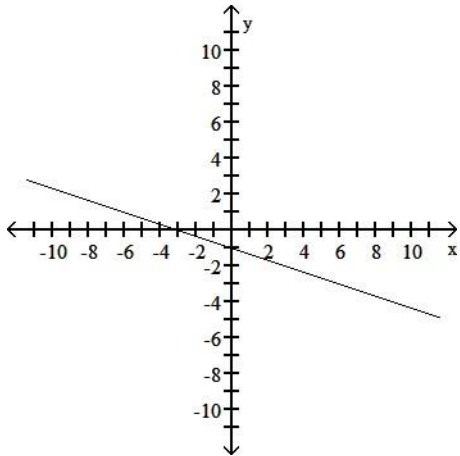
A)



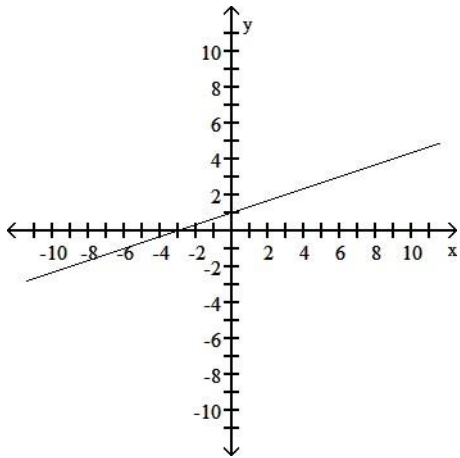
B)



C)

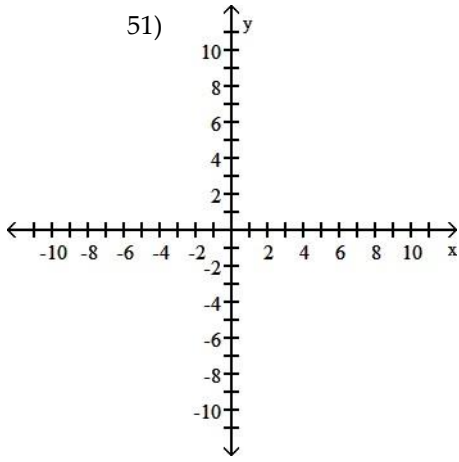


D)



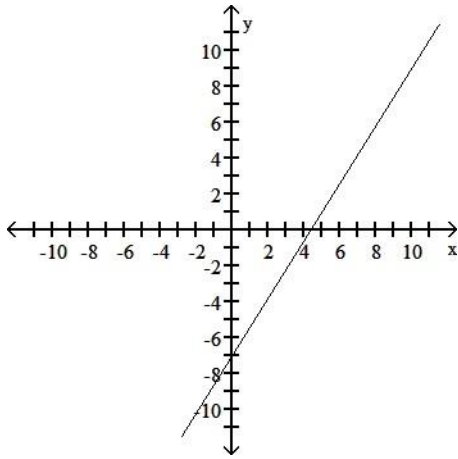
51) $5y + 8x = -35$

51)

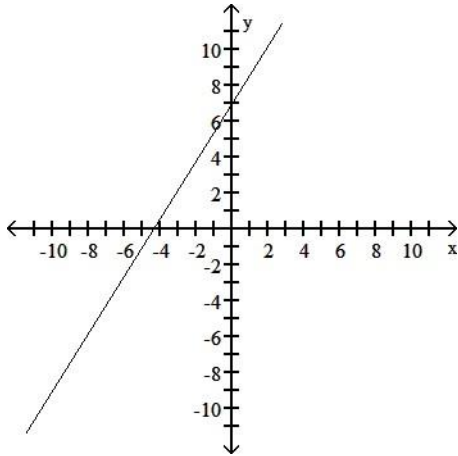


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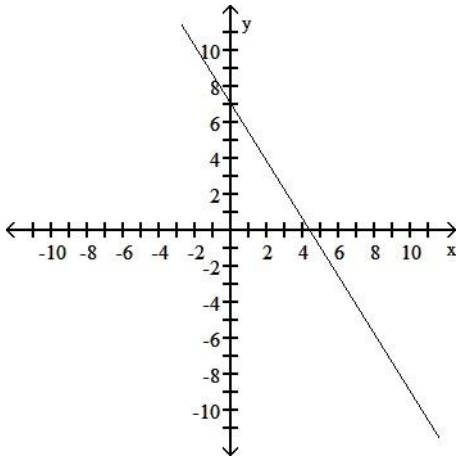
A)



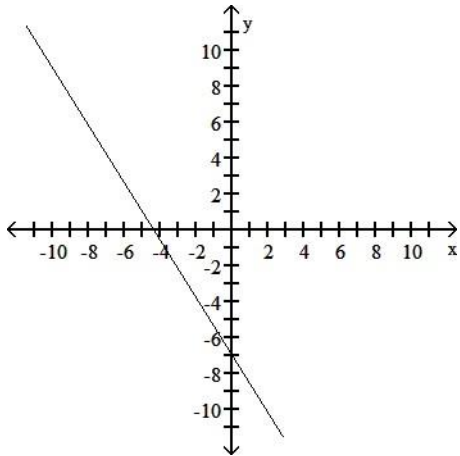
B)



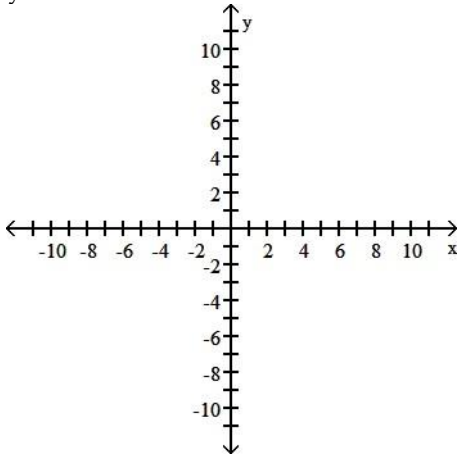
C)



D)

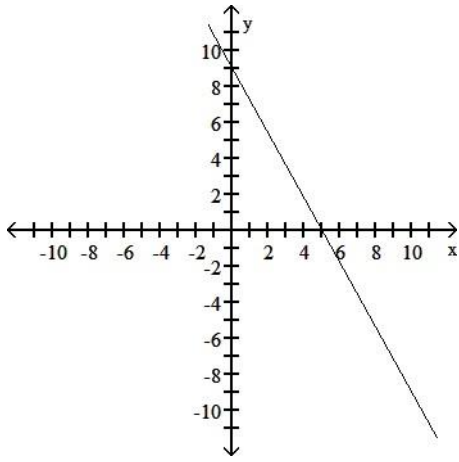


52) $5y - 9x = 45$

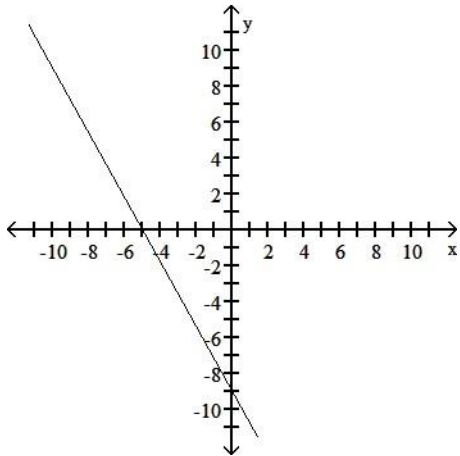


A)

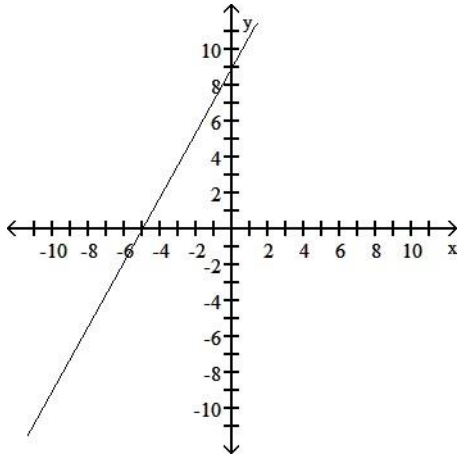
52) _____



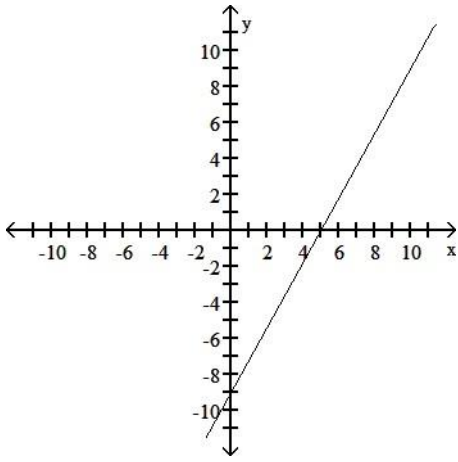
B)



C)

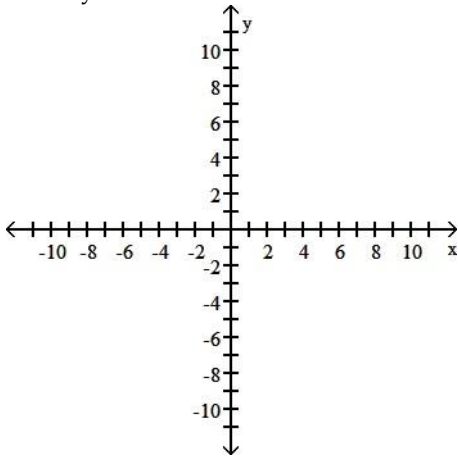


D)

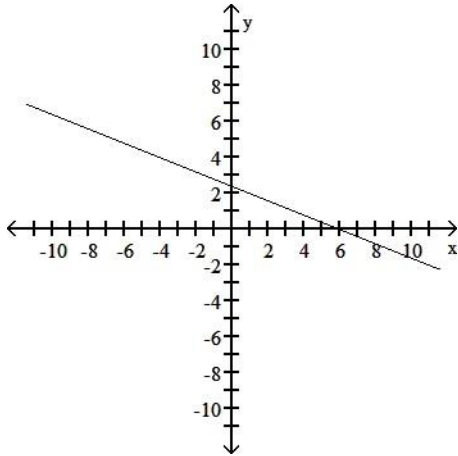


53) $2x + 5y = 12$

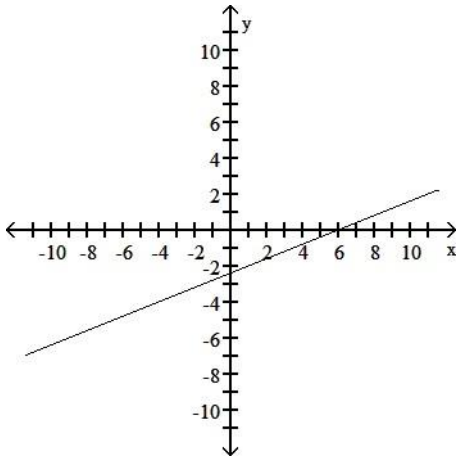
53) _____



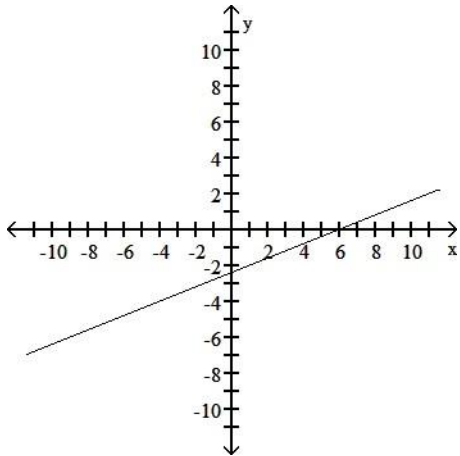
A)



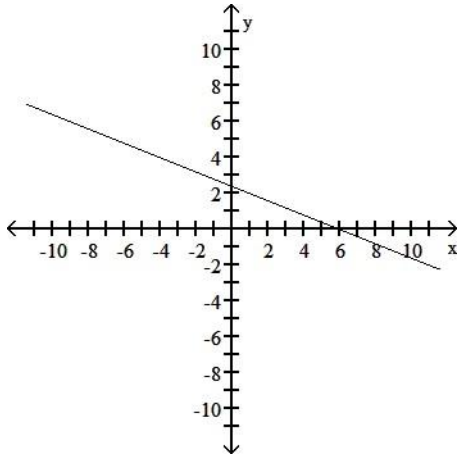
B)



C)

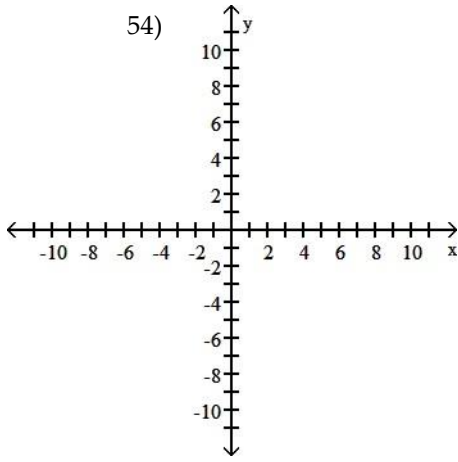


D)



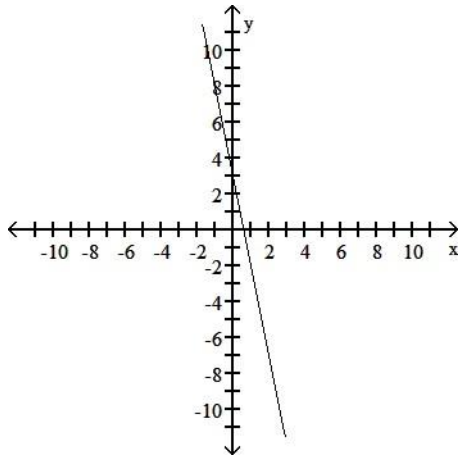
54) $5x + y = -3$

54)

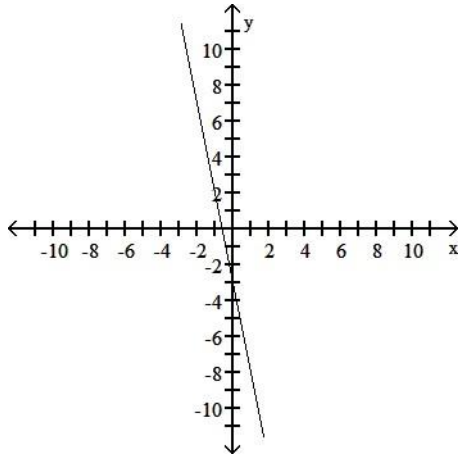


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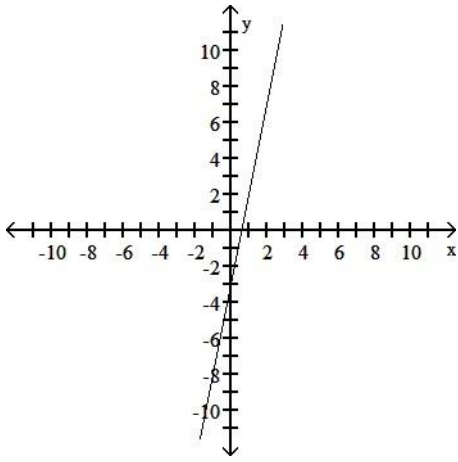
A)



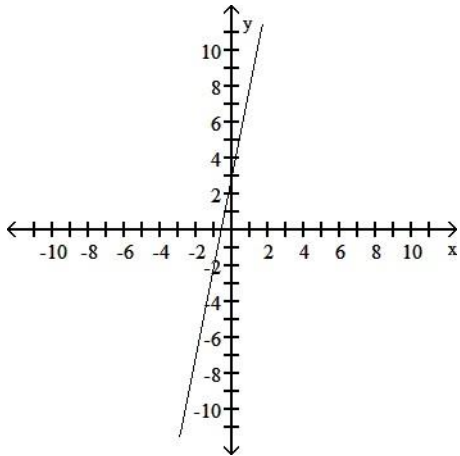
B)



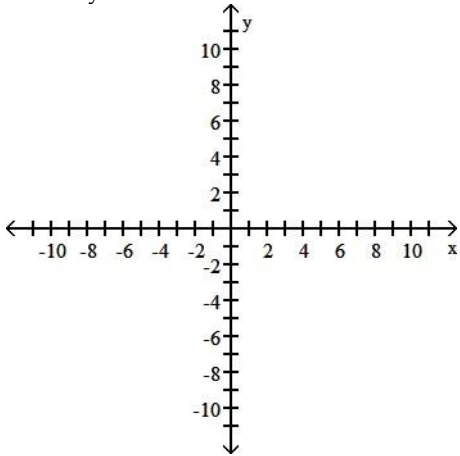
C)



D)

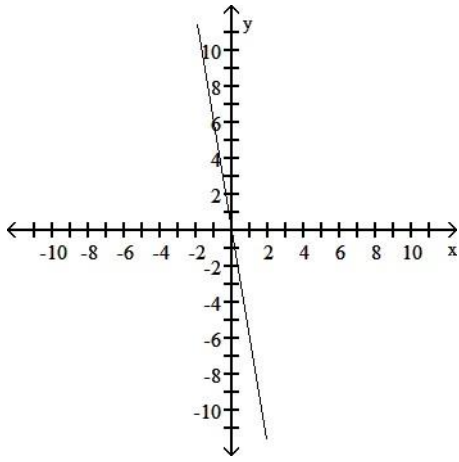


55) $6x - 24y = 0$

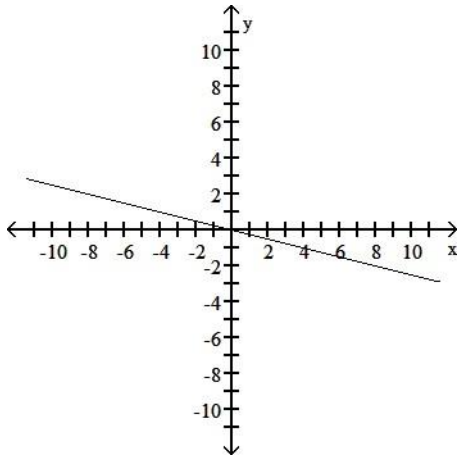


A)

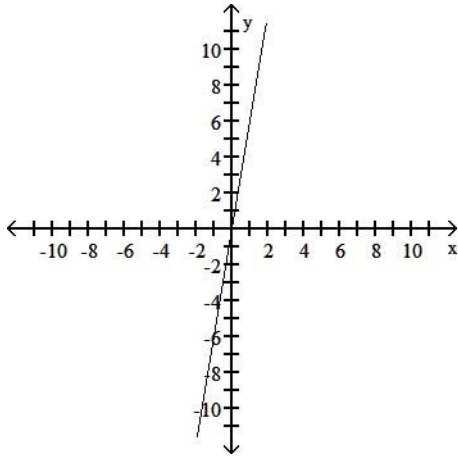
55) _____



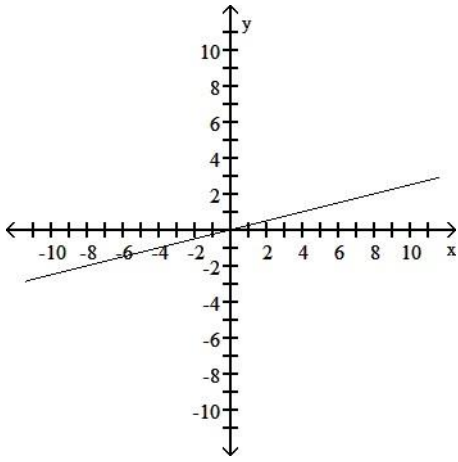
B)



C)

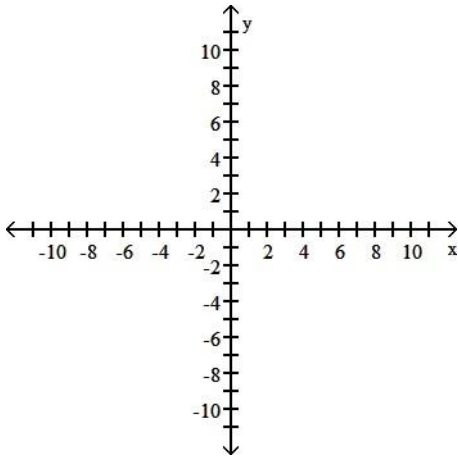


D)

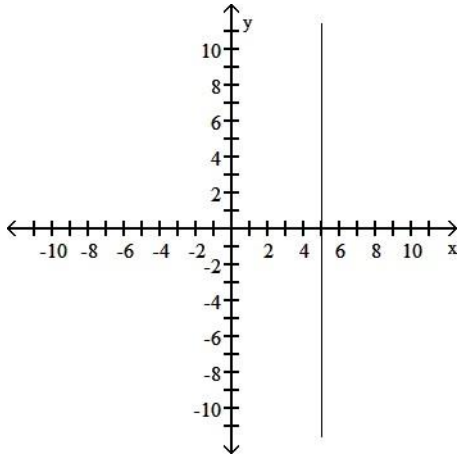


56) $x = 5$

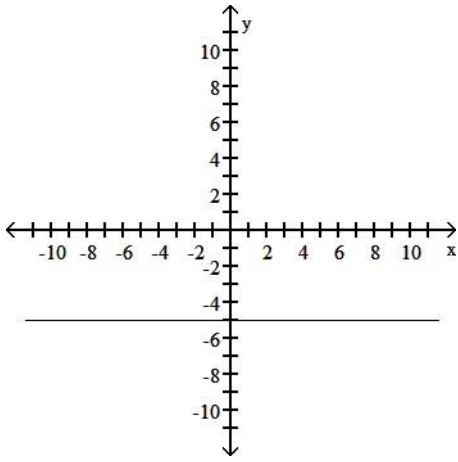
56) _____



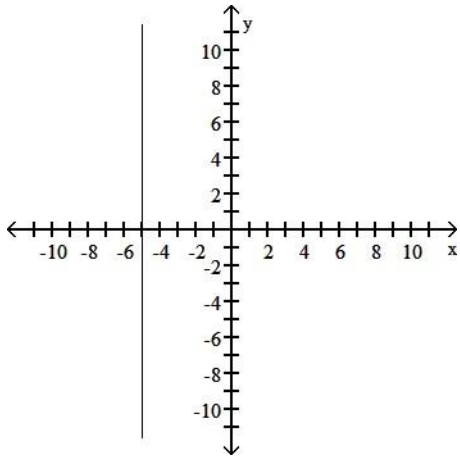
A)



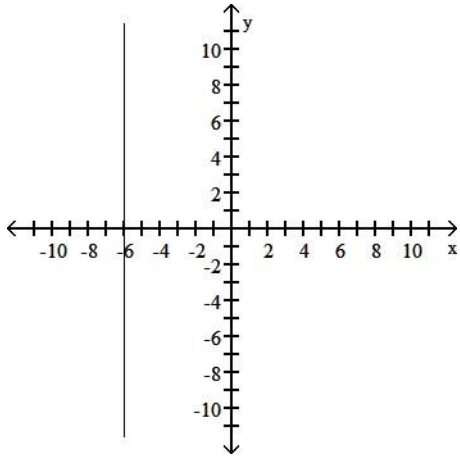
B)



C)

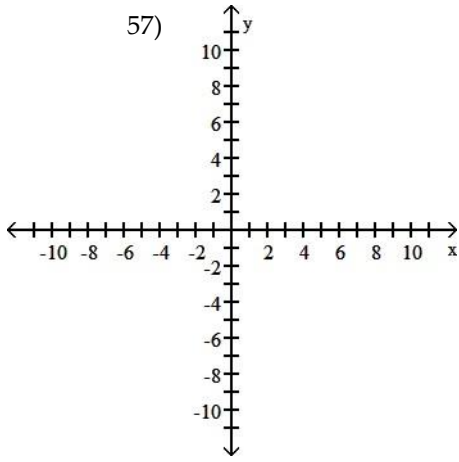


D)



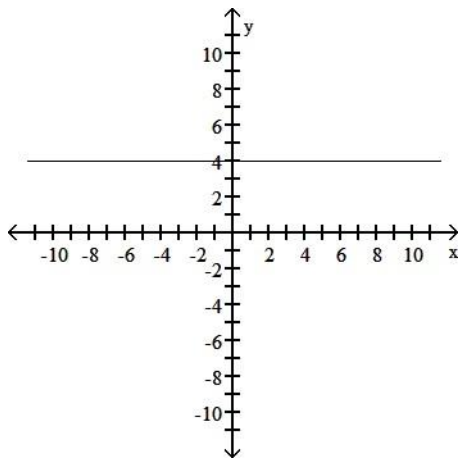
57) $y = -4$

57)

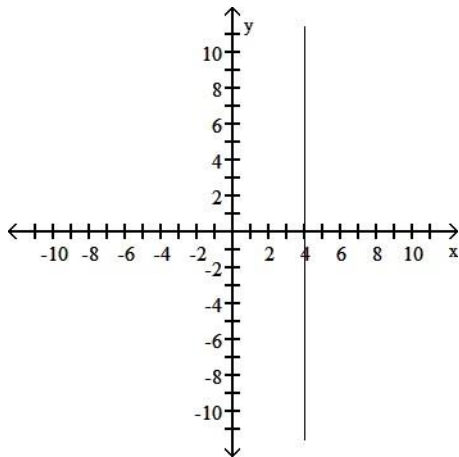


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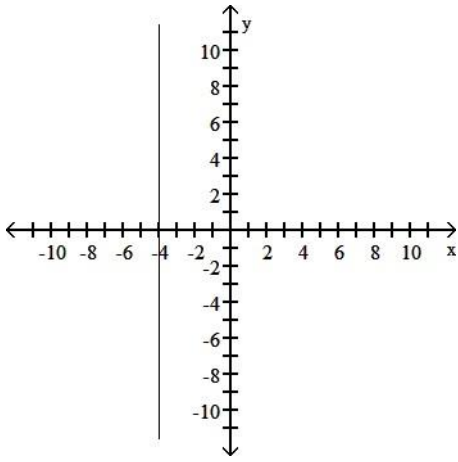
A)



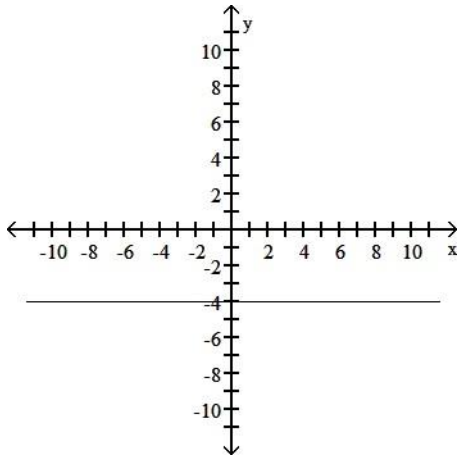
B)



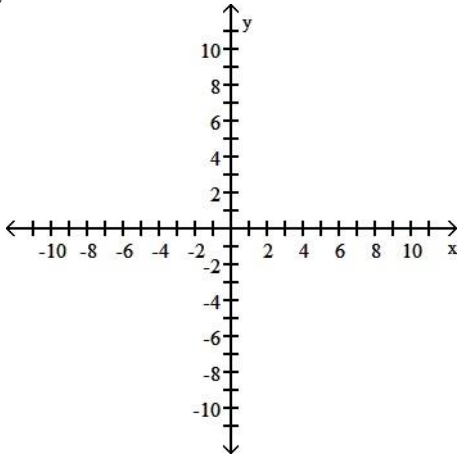
C)



D)

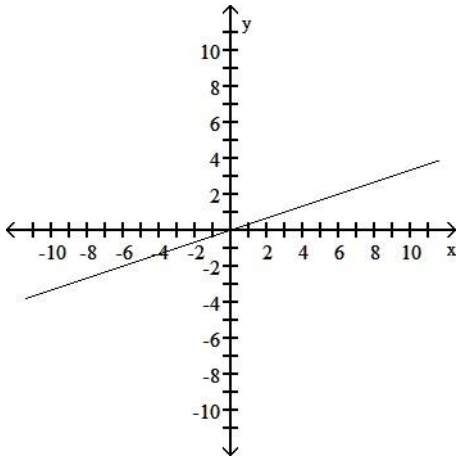


58) $y - 3 = 0$

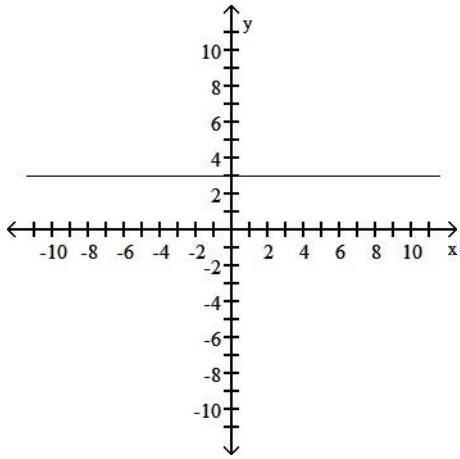


A)

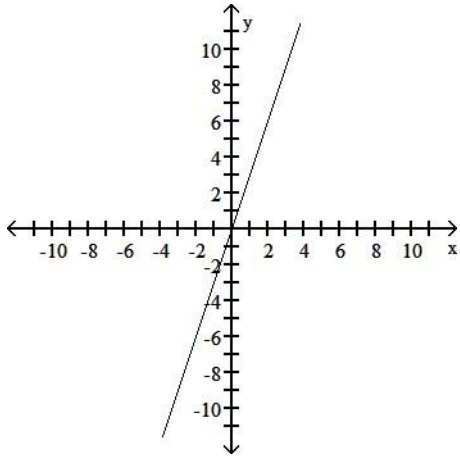
58) _____



B)



C)



D)

C) $y = 1.29x + 15,384$

D) $y = -1.29x + 1282$

- 64) In a lab experiment 8 grams of acid were produced in 16 minutes and 16 grams in 22 minutes. Let y be the grams produced in x minutes. 64) _____

Write a linear equation for grams produced.

A) $y = \frac{4}{3}x + \frac{40}{3}$

B) $y = \frac{3}{4}x + \frac{40}{3}$

C) $y = -\frac{4}{3}x + \frac{40}{3}$

D) $y = \frac{4}{3}x - \frac{40}{3}$

- 65) A biologist recorded 13 snakes on 13 acres in one area and 19 snakes on 33 acres in another area. Let y be the number of snakes in x acres. 65) _____

Write a linear equation for the number of snakes.

A) $y = -\frac{3}{10}x - \frac{91}{10}$

B) $y = \frac{3}{10}x + \frac{91}{10}$

C) $y = \frac{10}{3}x - \frac{91}{10}$

D) $y = \frac{3}{10}x - \frac{91}{10}$

- 66) The following data show the list price, x , in thousands of dollars, and the dealer invoice price, y , also in thousands of dollars, for a variety of sport utility vehicles. Find a linear equation that approximates the data, using the points (16.5, 16.1) and (20.0, 18.3). 66) _____

List Price	Dealer Invoice Price
16.5	16.1
17.6	17.0
20.7	18.2
23.1	19.3
20.0	18.3
24.6	21.0

A) $y = 0.629x + 5.73$

B) $y = 1.59x - 9.11$

C) $y = 0.629x + 6.38$

D) $y = 1.59x - 10.2$

- 67) The information in the chart gives the salary of a person for the stated years. Model the data with a linear function using the points (1, 24,400) and (3, 26,500). 67) _____

Year, x	Salary, y
1990, 0	\$23,500
1991, 1	\$24,400
1992, 2	\$25,200
1993, 3	\$26,500
1994, 4	\$27,200

A) $y = -1294x + 23,350$

B) $y = 1050x$

C) $y = 28.6x + 23,350$

D) $y = 1050x + 23,350$

- 68) The change in a certain engineer's salary over time can be approximated by the linear equation $y = 1500x + 47,500$ where y represents salary in dollars and x represents number of years on the job. According to this equation, after how many years on the job was the engineer's salary \$58,000? 68) _____

- A) 9 years B) 6 years C) 7 years D) 8 years

69) The relationship between the list price, x , in thousands of dollars, and the dealer invoice price, y , also in thousands of dollars, for pickup trucks can be approximated by the linear equation $y = 0.715x + 2.82$. Use this equation to predict the dealer invoice price for a pickup truck with a list price of 21.5 thousand dollars.

- A) 15.373 thousand dollars B) 26.126 thousand dollars
C) 18.193 thousand dollars D) 23.059 thousand dollars

70) Suppose the sales of a particular brand of appliance satisfy the relationship $S = 220x + 1000$, where S represents the number of sales in year x , with $x = 0$ corresponding to 1982. Find the number of sales in 1994.

- A) 3640 sales B) 3420 sales
C) 7060 sales D) 7280 sales

71) The mathematical model $C = 900x + 100,000$ represents the cost in dollars a company has in manufacturing x items during a month. Based on this, how much does it cost to produce 200 items?

- A) \$ 111.11 B) \$ 180,000 C) \$ 280,000 D) \$ 0.56

72) Suppose the function $y = 1.2t - 2.3$ determines the actual time that has elapsed, in minutes, for t minutes of a person's estimate of the elapsed time. Find the actual time that has elapsed for an estimate of $t = 60$ minutes.

- A) 62.76 min B) 57.24 min
C) 69.7 min D) 74.3 min

73) A car rental company charges \$29 per day to rent a particular type of car and \$0.13 per mile. Juan is charged \$50.19 for a one-day rental. How many miles did he drive?

- A) 357 mi B) 386 mi C) 178 mi D) 163 mi

74) If an object is dropped from a tower, then the velocity, V (in feet per second), of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Write an equation expressing the velocity, V , in terms of the number of seconds, t . Use this function to predict the velocity of the object at time $t = 7.3$ seconds.

- A) 243.6 feet per second B) 241.6 feet per second
C) 242.9 feet per second D) 244.9 feet per second

75) The information in the chart below gives the salary of a person for the stated years. Model the data with a linear function using the points (1, 24,600) and (3, 26,500). Then use this function to predict the salary for the year 2008.

Year, x	Salary, y
1990, 0	\$23,500
1991, 1	\$24,600
1992, 2	\$25,200
1993, 3	\$26,500
1994, 4	\$27,200

- A) \$40,580 B) \$40,600 C) \$40,620 D) \$40,640

- 76) In order to receive a B in a course, it is necessary to get an average of 80% correct on two one-hour exams of 100 points each, on one midterm exam of 200 points, and on one final exam of 500 points. If a student scores 90, and 83 on the one-hour exams, and 140 on the midterm exam, what is the minimum score on the final exam that the person can get and still earn a B? 76) _____
- A) 452 B) 317 C) 587 D) 407

Evaluate the function as indicated.

- 77) Find $f(16)$ when $f(x) = -11x - 5$. 77) _____
- A) 171 B) -181 C) -176.5 D) -171
- 78) Find $f(-4)$ when $f(x) = -6x - 3$. 78) _____
- A) -9 B) 36 C) 21 D) 27
- 79) Find $f(0)$ when $f(x) = -15x + 16$. 79) _____
- A) -15 B) 0 C) 1 D) 16
- 80) Find $f(0.9)$ when $f(x) = -5.1x + 5$. 80) _____
- A) 0.41 B) -9.59 C) -4.09 D) 9.59
- 81) Find $f(0.3)$ when $f(x) = 5x - 9.0$. 81) _____
- A) -7.5 B) -10.5 C) 10.5 D) 0.6
- 82) Find $g\left(\frac{2}{7}\right)$ when $g(x) = 4 - 2x$. 82) _____
- A) $\frac{24}{7}$ B) $\frac{24}{7}$ C) $\frac{32}{7}$ D) $\frac{2}{7}$
- 83) Find $f(4.9)$ when $f(x) = 14$. 83) _____
- A) 14 B) 4.9 C) 68.6 D) -14
- 84) Find $f(-r)$ when $f(x) = 9 - 4x$. 84) _____
- A) $r - 4x$ B) $9 + 4r$ C) $9 - 4r$ D) $9 + rx$
- 85) Find $g(k^2)$ when $g(x) = 8 - 3x$. 85) _____
- A) $8 + 3k^2$ B) $8 + k^2$ C) $8 + 3k^2$ D) $8 - 3x^2$
- 86) Find $g(a - 1)$ when $g(x) = 4x - 1$. 86) _____
- A) $4a + 1$ B) $4a - 5$ C) $\frac{1}{4}a - 1$ D) $4a - 1$

Write a cost function for the problem. Assume that the relationship is linear.

- 87) A moving firm charges a flat fee of \$ 35 plus \$ 30 per hour. Let $C(x)$ be the cost in dollars of using the moving firm for x hours. 87) _____
- A) $C(x) = 35x - 30$ B) $C(x) = 35x + 30$
 C) $C(x) = 30x + 35$ D) $C(x) = 30x - 35$

- 88) A cab company charges a base rate of \$ 1.00 plus 10 cents per minute. 88) _____
 Let $C(x)$ be the cost in dollars of using the cab for x minutes.
 A) $C(x) = 0.10x - 1.00$ B) $C(x) = 1.00x - 0.10$
 C) $C(x) = 1.00x + 0.10$ D) $C(x) = 0.10x + 1.00$

- 89) An electrician charges a fee of \$ 45 plus \$ 30 per hour. Let $C(x)$ be the 89) _____
 cost in dollars of using the electrician for x hours.
 A) $C(x) = 45x - 30$ B) $C(x) = 30x - 45$
 C) $C(x) = 45x + 30$ D) $C(x) = 30x + 45$

- 90) A cable TV company charges \$ 25 for the basic service plus \$ 5 for each 90) _____
 movie channel. Let $C(x)$ be the total cost in dollars of subscribing to
 cable TV, using x movie channels.
 A) $C(x) = 25x - 5$ B) $C(x) = 5x + 25$
 C) $C(x) = 25x + 5$ D) $C(x) = 5x - 25$

- 91) Fixed cost, \$ 340; 10 items cost \$ 1830 to produce 91) _____
 A) $C(x) = 149x + 340$ B) $C(x) = 149x + 1830$
 C) $C(x) = 298x + 1830$ D) $C(x) = 298x + 340$

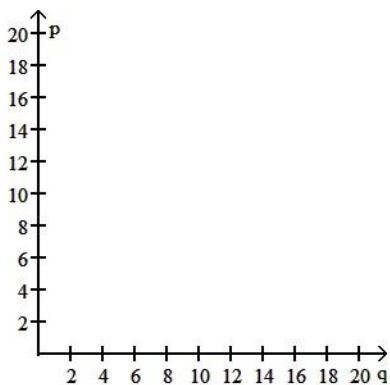
- 92) Marginal cost, \$ 80; 90 items cost \$ 8000 to produce 92) _____
 A) $C(x) = 80x + 800$ B) $C(x) = 9x + 8000$
 C) $C(x) = 80x + 8000$ D) $C(x) = 9x + 800$

Solve the problem.

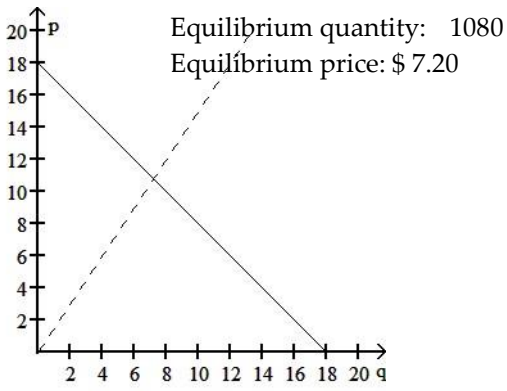
- 93) Let the supply and demand functions for a certain model of electric 93) _____
 pencil sharpener be given by

$$p = S(q) = \frac{2}{3}q \quad \text{and} \quad p = D(q) = 18 - \frac{4}{3}q,$$

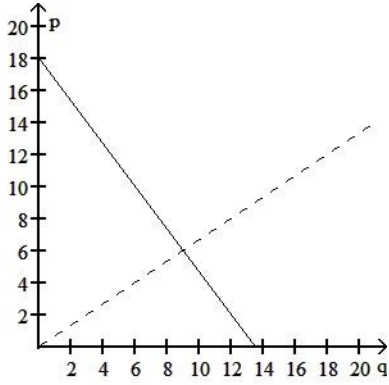
where p is the price in dollars and q is the quantity of pencil sharpeners (in hundreds). Graph these functions on the same axes (graph the supply function as a dashed line and the demand function as a solid line). Also, find the equilibrium quantity and the equilibrium price.



A)

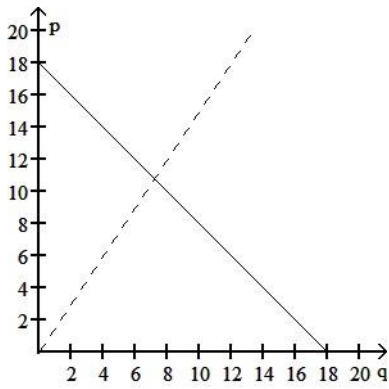


B)



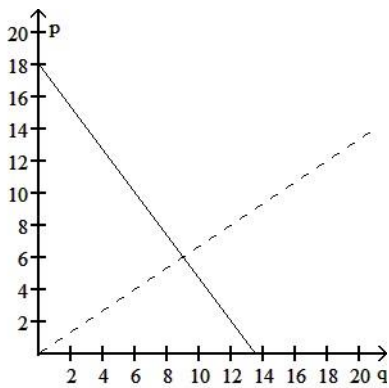
Equilibrium quantity: 950
Equilibrium price: \$7

C)



Equilibrium quantity: 720
Equilibrium price: \$ 10.80

D)



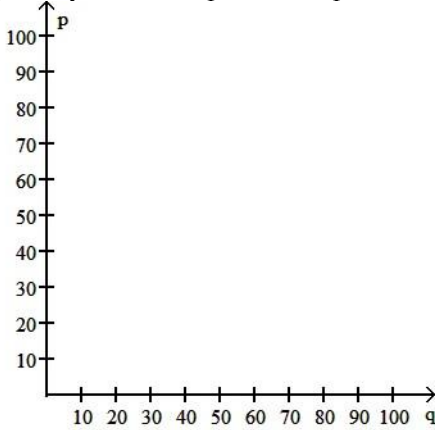
Equilibrium quantity: 900

Equilibrium price: \$ 6

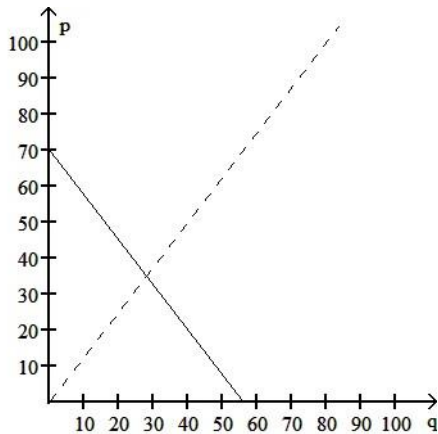
94) Let the supply and demand functions for raspberry-flavored licorice be given by 94) _____

$$p = S(q) = \frac{5}{4}q \quad \text{and} \quad p = D(q) = 70 - \frac{3}{4}q,$$

where p is the price in dollars and q is the number of batches. Graph these functions on the same axes (graph the supply function as a dashed line and the demand function as a solid line). Also, find the equilibrium quantity and the equilibrium price.



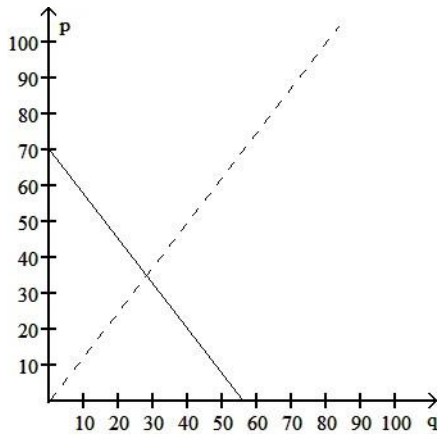
A)



Equilibrium quantity: 28

Equilibrium price: \$ 35.00

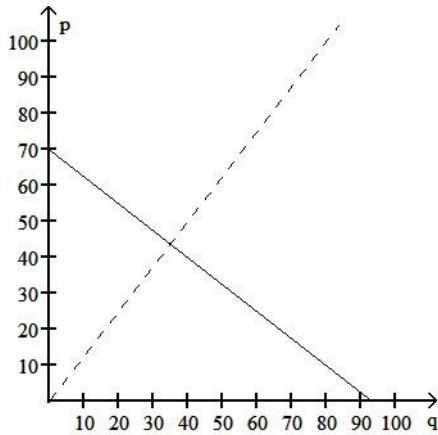
B)



Equilibrium quantity: 35.00

Equilibrium price: \$ 28

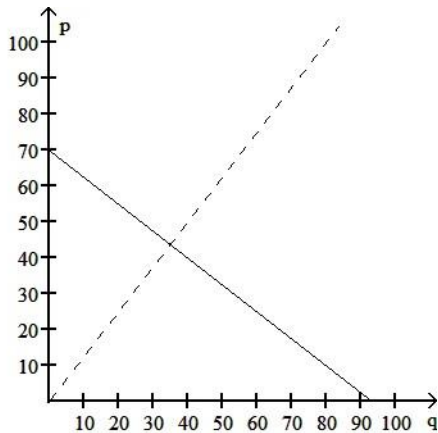
C)



Equilibrium quantity: 35

Equilibrium price: \$ 43.75

D)



Equilibrium quantity: 43.75

Equilibrium price: \$ 35

95) Given the supply and demand functions below, find the price when the demand is 145. 95) _____

$$S(p) = 9p + 12$$

$$D(p) = 280 - 9p$$

- A) \$292 B) \$47 C) \$1317 D) \$15

96) Suppose that the demand and price for a certain model of graphing calculator are related by $p = D(q) = 102 - 3.5q$, where p is the price (in dollars) and q is the demand (in hundreds). Find the price if the demand is 200 calculators. 96) _____

- A) \$ 32.00 B) \$ 109.00 C) \$ 172.00 D) \$ 95.00

97) Given the supply and demand functions below, find the demand when $p = \$12$. 97) _____

$$S(p) = 5p$$

$$D(p) = 120 - 4p$$

- A) 72 B) 132 C) 48 D) 60

98) Suppose that the demand and price for a certain model of graphing calculator

are 98)

related

by

$$p = D(q) = 98 - 1.5q,$$

where p

is the

price (in

dollars)

and q is

the

demand

(in

hundred

s). Find

the

demand

for the

calculato

r if the

price is \$

35.

Round to

the

nearest

whole

number

if

necessar

y.

A) 42 calculators

B) 1050 calculators

C) 4200 calculators

D) 25,200 calculators

99) Suppose that the price and supply for a certain model of graphing calculator are related by $p = S(q) = 3q$, where p is the price (in dollars) and q is the supply (in hundreds) of calculators. Find the supply if the price is \$ 95. Round to the nearest whole number if necessary.

A) 1583 calculators

B) 3167 calculators

C) 317 calculators

D) 792 calculators

100) Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars. Find the equilibrium price and equilibrium quantity for the given functions.

$$D(p) = 3420 - 80p$$

$$S(p) = 100p$$

A) \$ 20; 1820

B) \$ 19; 1900

C) \$ 20; 1900

D) \$ 34; 700

101) Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars. Find the equilibrium price and equilibrium quantity for the given functions.

$$D(p) = 210,820 - 230p$$

$$S(p) = 1040p$$

—

—

99) _____

100) _____

101) _____

- A) \$ 810; 172,640 B) \$ 166; 172,640
 C) \$ 202; 164,360 D) \$ 810; 24,520

102) Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars. Find the equilibrium price and equilibrium quantity for the given functions. 102) _____

$D(p) = 5040 - 90p$
 $S(p) = 210p - 1260$

- A) \$ 30; 3150 B) \$ 30; 2340
 C) \$ 52; 360 D) \$ 21; 3150

103) A book publisher found that the cost to produce 1000 calculus textbooks is \$26,300, while the cost to produce 2000 calculus textbooks is \$51,900. Assume that the cost $C(x)$ is a linear function of x , the number of textbooks produced. What is the marginal cost of a calculus textbook? 103) _____

- A) \$ 0.03 B) \$ 25.60
 C) \$ 25,600.00 D) \$ 2.56

104) In deciding whether or not to set up a new manufacturing plant, analysts for a popcorn company have decided that a linear function is a reasonable estimation for the total cost $C(x)$ in dollars to produce x bags of microwave popcorn. They estimate the cost to produce 10,000 bags as \$5310 and the cost to produce 15,000 bags as \$7560. Find the marginal cost of the bags of microwave popcorn to be produced in this plant. 104) _____

- A) \$ 0.45 B) \$ 45.00 C) \$ 2250.00 D) \$ 4.50

105) A toilet manufacturer has decided to come out with a new and improved toilet. The fixed cost for the production of this new toilet line is \$16,600 and the variable costs are \$62 per toilet. The company expects to sell the toilets for \$159. Formulate a function $C(x)$ for the total cost of producing x new toilets and a function $R(x)$ for the total revenue generated from the sales of x toilets. 105) _____

- A) $C(x) = 16,662; R(x) = 159$
 B) $C(x) = 16600 + 159x; R(x) = 62x$
 C) $C(x) = 16600 + 62x; R(x) = 159x$
 D) $C(x) = 62x; R(x) = 159x$

106) A toilet manufacturer has decided to come out with a new and improved toilet. The fixed cost for the production of this new toilet line is \$16,600 and the variable costs are \$66 per toilet. The company expects to sell the toilets for \$152. Formulate a function $P(x)$ for the total profit from the production and sale of x toilets. 106) _____

- A) $P(x) = 86x - 16600$ B) $P(x) = 86x$
 C) $P(x) = 152x - 16600$ D) $P(x) = 86x + 16600$

107) A shoe company will make a new type of shoe. The fixed cost for the production will be \$24,000. The variable cost will be \$31 per pair of shoes. The shoes will sell for \$106 for each pair. What is the profit if 600 pairs are sold? 107) _____

- A) \$ 45,000 B) \$ 69,000 C) \$ 58,200 D) \$ 21,000

108) Midtown Delivery Service delivers packages which cost \$ 1.00 per pack age to

deliver. 108)

The fixed cost to run the delivery truck is \$205 per day. If the company charges \$6.00 per package, how many packages must be delivered daily to make a profit of \$90?

-

- A) 41 packages B) 59 packages
C) 29 packages D) 205 packages

109) Re grind, Inc. regrinds used typewriter platens. The cost per platen is \$1.20. The cost to regrind 100 platens is \$300. Find the linear cost function to regrind platens. If reground platens sell for \$10.80 each, how many must be reground and sold to break even?

109) _____

- A) $C(x) = 1.20x + 300$ B) $C(x) = 1.20x + 180$
break-even = 26 break-even = 190
C) $C(x) = 1.20x + 180$ D) $C(x) = 1.20x + 300$
break-even = 19 break-even = 32

110) Re grind, Inc. regrinds used typewriter platens. The cost per platen is \$2.90. The fixed cost to run the grinding machine is \$480 per day. If the company sells the reground platens for \$7.90, how many must be reground daily to break even?

110) _____

- A) 165 platens B) 44 platens
C) 96 platens D) 64 platens

111) Northwest Molded molds plastic handles which cost \$1.00 per handle to mold. The fixed cost to run the molding machine is \$6729 per week. If the company sells the handles for \$4.00 each, how many handles must be molded weekly to break even?

111) _____

- A) 2243 handles B) 6729 handles
C) 1495 handles D) 1345 handles

112) Midtown Delivery Service delivers packages which cost \$1.30 per package to deliver. The fixed cost to run the delivery truck is \$120 per day. If the company charges \$6.30 per package, how many packages

must daily be delivered to break even?

112)

- _____
- A) 24 packages B) 15 packages
C) 16 packages D) 92 packages

- 113) A lumber yard has fixed costs of \$ 3978.00 a day and variable costs of \$ 1.00 per board-foot produced. The company gets \$ 2.80 per board-foot sold. How many board-feet must be produced daily to break even? 113) _____
- A) 2210 board-feet B) 3978 board-feet
C) 1046 board-feet D) 1473 board-feet
- 114) A shoe company will make a new type of shoe. The fixed cost for the production will be \$24,000. The variable cost will be \$35 per pair of shoes. The shoes will sell for \$105 for each pair. How many pairs of shoes will have to be sold for the company to break even on this new line of shoes? 114) _____
- A) 70 pairs B) 686 pairs C) 343 pairs D) 229 pairs
- 115) When going more than 38 miles per hour, the gas mileage of a certain car fits the model $y = 43.81 - 0.395x$ where x is the speed of the car in miles per hour and y is the miles per gallon of gasoline. Based on this model, at what speed will the car average 15 miles per gallon? (Round to nearest whole number.) 115) _____
- A) 149 miles per hour B) 73 miles per hour
C) 98 miles per hour D) 48 miles per hour
- 116) The temperature of water in a certain lake on a day in October can be determined by using the model $y = 15.2 - 0.537x$ where x is the number of feet down from the surface of the lake and y is the Celsius temperature of the water at that depth. Based on this model, how deep in the lake is the water 12 degrees? (Round to the nearest foot.) 116) _____
- A) 62 feet B) 6 feet C) 25 feet D) 51 feet
- 117) The bank's temperature display shows that it is 25° Celsius. What is the temperature in Fahrenheit? 117) _____
- A) 77.0° B) 102.6° C) 31.7° D) -3.9°
- 118) On a summer day, the surface water of a lake is at a temperature of 20° Celsius. What is this temperature in Fahrenheit? 118) _____
- A) 68° B) 36° C) 20° D) 52°
- 119) On a summer day, the bottom water of a lake is at a temperature of 5° Celsius. What is this temperature in Fahrenheit? 119) _____
- A) 5° B) 37° C) 41° D) 9°
- 120) The outdoor temperature rises to 10° Fahrenheit. What is this temperature in Celsius? 120) _____
- A) 5.6° B) -12.2° C) -22° D) 10°
- 121) A meteorologist in the Upper Peninsula of Michigan predicts an overnight low of -9° Fahrenheit. What would a Canadian meteorologist predict for the same location in Celsius? 121) _____

- A) -5° B) -22.8° C) -9° D) -41°

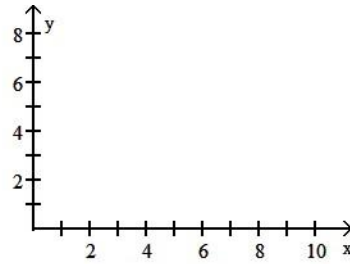
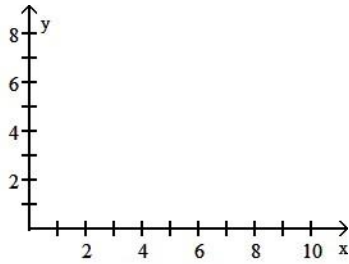
122) Find the temperature at which the Celsius and Fahrenheit scales coincide. 122) _____

- A) -40° B) 0° C) 37° D) -27°

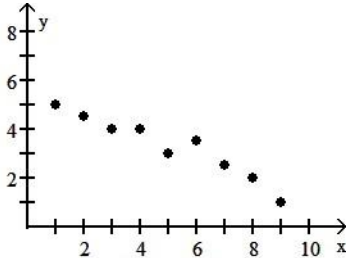
123) For the following table of data, 123) _____

- Draw a scatterplot.
- Calculate the correlation coefficient.
- Calculate the least squares line and graph it on the scatterplot.
- Predict the y-value when x is 23.

x	1	2	3	4	5	6	7	8	9
y	5	4.5	4	4	3	3.5	2.5	2	1

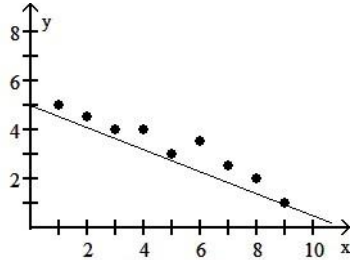


A) a.



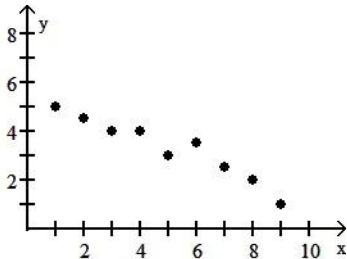
b. -0.965

c. $Y = -0.45x - 5.53$



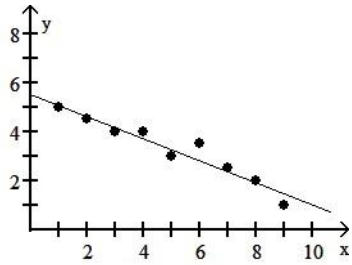
d. -15.88

B) a.



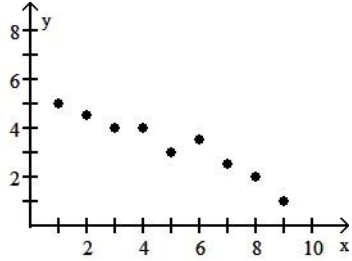
b. -0.965

c. $Y = -0.45x + 5.53$



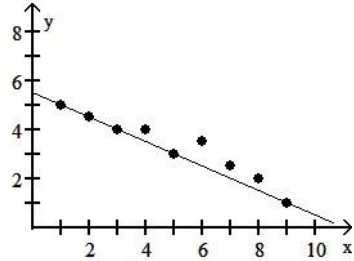
d. -4.82

C) a.



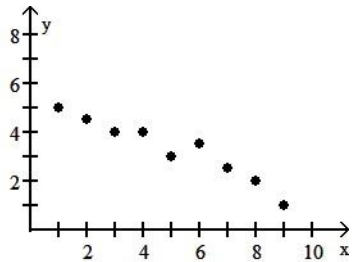
b. 0.965

c. $Y = -0.45x + 5.53$



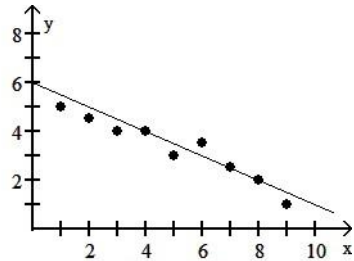
d. -4.82

D) a.



b. 0.965

c. $Y = 0.45x - 5.53$



d. 4.82

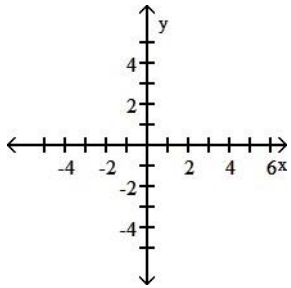
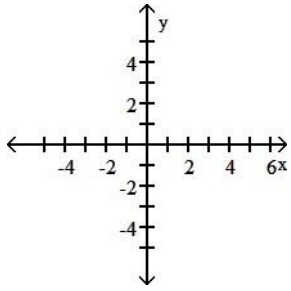
124) For the following table of data,

- Draw a scatterplot.
- Calculate the correlation coefficient.
- Calculate the least squares line and graph it on the scatterplot.

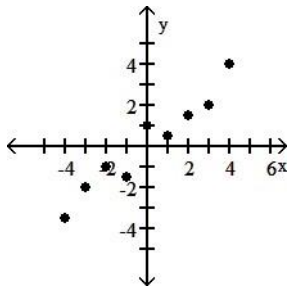
- the y-value
Predict
ct when

x is -25. 124)

x	-4	-3	-2	-1	0	1	2	3	4
y	-3.5	-2	-1	-1.5	1	0.5	1.5	2	4

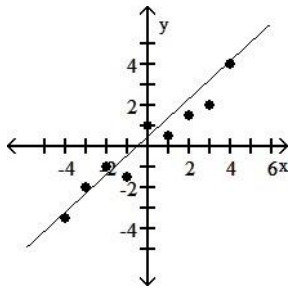


A) a.



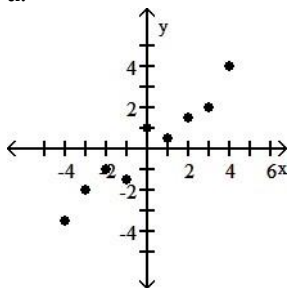
b. 0.966

c. $Y = 0.82x - 0.11$



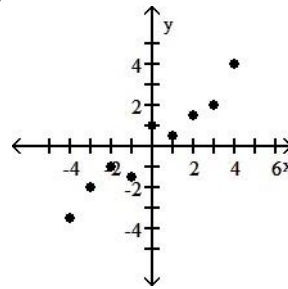
d. -20.61

C) a.



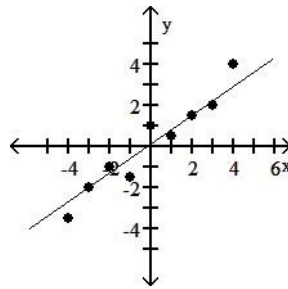
b. -0.966

B) a.



b. -0.966

c. $Y = -0.82x - 0.11$



d. 20.39

c.

Y

=

0.

82

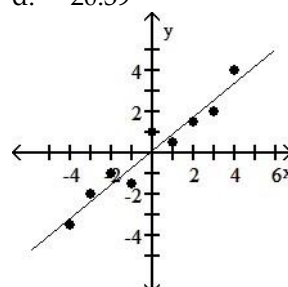
x

+

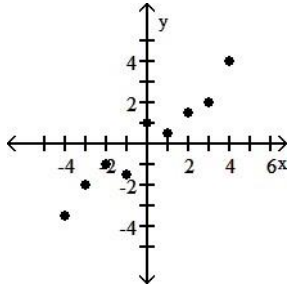
0.

11

d. -20.61

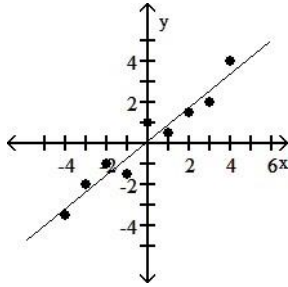


D) a.



b. 0.966

c. $Y = 0.82x + 0.11$



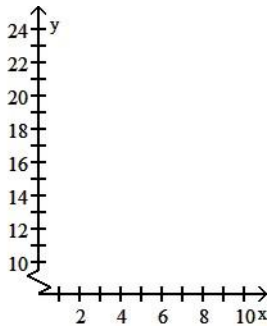
d. -20.39

125) For the following table of data,

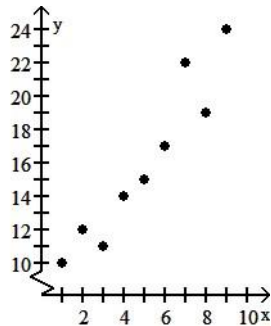
- Draw a scatterplot.
- Calculate the correlation coefficient.
- Calculate the least squares line and graph it on the scatterplot.
- Predict the y-value when x is 11.

125) _____

x	1	2	3	4	5	6	7	8	9
y	10	12	11	14	15	17	22	19	24

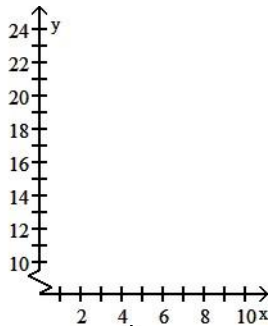


A) a.

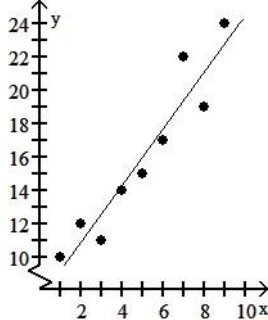


b. 0.950

c. $Y = 1.7x + 8.5$



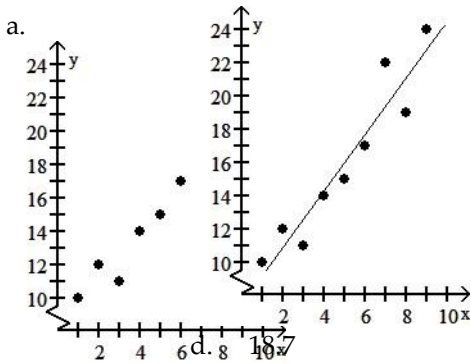
B)



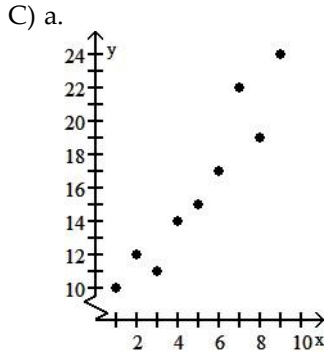
d.

27

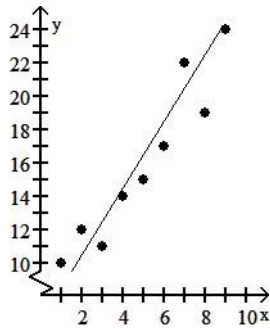
.2



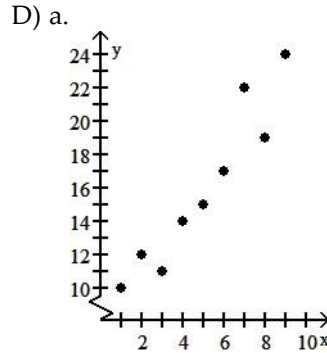
- b. 0.950
c. $Y = 1.7x$



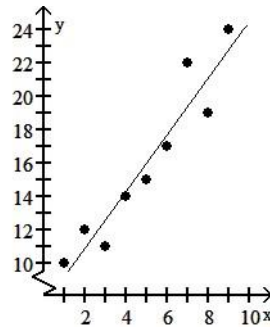
- b. 0.903
c. $Y = 2x + 6.5$



- d. 28.5



- b. 0.950
c. $Y = 1.7x + 7.5$



- d. 26.2

Find the coefficient of correlation.

126) Consider the data points with the following coordinates:

x	15.2	31.5	17.8	25.0	48.2
y	5	6	8	8	10

- A) 0.6846 B) 0 C) 0.6093 D) -0.6846

126) _____

127) The test scores of 6 randomly picked students and the number of hours they prepared are as follows:

Hours	5	10	4	6	10	9
Score	64	86	69	86	59	87

- A) 0.6781 B) 0.2242 C) -0.2242 D) -0.6781

127) _____

128) The test scores of 6 randomly picked students and the number of hours they prepared are as follows:

Hours	4	10	5	5	3	3
Score	54	99	56	99	70	72

- A) 0.6039 B) 0.2015 C) -0.2241 D) -0.6781

128) _____

- 129) Consider the data points with the following coordinates: 129) _____
- | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|
| x | 57 | 53 | 59 | 61 | 53 | 56 | 60 |
| y | 156 | 164 | 163 | 177 | 159 | 175 | 151 |
- A) 0.1085 B) 0.2145 C) -0.0783 D) -0.0537

- 130) Consider the data points with the following coordinates: 130) _____
- | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|
| x | 62 | 53 | 64 | 52 | 52 | 54 | 58 |
| y | 158 | 176 | 151 | 164 | 164 | 174 | 162 |
- A) 0.7537 B) -0.7749 C) 0 D) -0.0810

- 131) Consider the data points with the following coordinates: 131) _____
- | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|
| x | 121 | 101 | 128 | 160 | 154 | 126 | 134 |
| y | 171 | 152 | 168 | 157 | 164 | 169 | 160 |
- A) 0.0537 B) 0.2245 C) -0.0781 D) 0.5370

- 132) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 132) _____
- | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|
| Cost | 9 | 2 | 3 | 4 | 2 | 5 | 9 | 10 |
| Number | 85 | 52 | 55 | 68 | 67 | 86 | 83 | 73 |
- A) 0.2456 B) 0.2353 C) -0.0707 D) 0.7077

- 133) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 133) _____
- | | | | | | | | | |
|--------|----|----|----|----|----|----|----|-----|
| Cost | 6 | 3 | 7 | 6 | 10 | 4 | 7 | 7 |
| Number | 54 | 75 | 91 | 57 | 96 | 52 | 92 | 100 |
- A) 0.6756 B) 0.6112 C) -0.3707 D) 0.2635

- 134) The following are the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters): 134) _____
- | | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|----|
| Temp | 62 | 76 | 50 | 51 | 71 | 46 | 51 | 44 | 79 |
| Growth | 36 | 39 | 50 | 13 | 33 | 33 | 17 | 6 | 16 |
- A) 0 B) 0.2563 C) -0.2105 D) 0.1955

- 135) The following are the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters): 135) _____
- | | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|----|
| Temp | 77 | 88 | 85 | 61 | 64 | 72 | 73 | 63 | 74 |
| Growth | 39 | 17 | 12 | 22 | 15 | 29 | 14 | 25 | 43 |
- A) -0.3105 B) 0.0396 C) -0.0953 D) 0

Find the equation of the least squares line.

- 136) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) when they entered the program were between 3.5 and 4.0. The following data were obtained regarding their GPAs on entering the program versus their current GPAs. 3.9

Entering GPA (x)	Current GPA (y)	
3.5	3.6	
3.8	3.7	
3.6	3.9	3.7
3.6	3.6	3.5
3.5	3.9	
3.9	3.8	



- A) $y = 2.51 + 0.329x$ B) $y = 5.81 + 0.497x$
 C) $y = 3.67 + 0.0313x$ D) $y = 4.91 + 0.0212x$

137) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test. 137) _____

Hours (x)	5	10	4	6	10	9
Score (y)	64	86	69	86	59	87

- A) $y = 33.7 + 2.14x$ B) $y = -67.3 + 1.07x$
 C) $y = 67.3 + 1.07x$ D) $y = 33.7 - 2.14x$

138) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). 138) _____

Cost (x)	9	2	3	4	2	5	9	10
Number (y)	85	52	55	68	67	86	83	73

- A) $y = -26.4 - 1.42x$ B) $y = 55.8 + 2.79x$
 C) $y = 26.4 + 1.42x$ D) $y = 55.8 - 2.79x$

139) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). 139) _____

Temp (x)	62	76	50	51	71	46	51	44	79
Growth (y)	36	39	50	13	33	33	17	6	16

- A) $y = 7.30 + 0.122x$ B) $y = -14.6 - 0.211x$
 C) $y = 14.6 + 0.211x$ D) $y = 7.30 - 0.112x$

140) A study was conducted to compare the average time spent in the lab each week versus course grade for computer students. The results are recorded in the table below. 58

Number of hours spent in lab (x)	Grade (percent)(y)
96	10
51	11
62	16

140)

-

9 8

5 1

1 8

6 1

6 4

0 1

1 5

A) $y = 1.86 + 88.6x$

B) $y = 44.3 + 0.930x$

C) $y = 88.6 - 1.86x$

D) $y = 0.930 + 44.3x$

141) Two separate tests are designed to measure a student's ability to solve problems. Several students are randomly selected to take both tests and the results are shown below.

141) _____

Test A (x)	48	52	58	44	43	43	40	51	59
Test B (y)	73	67	73	59	58	56	58	64	74

A) $y = 19.4 + 0.930x$

B) $y = -19.4 - 0.930x$

C) $y = -0.930 + 19.4x$

D) $y = 0.930 - 19.4x$

- 142) Managers rate employees according to job performance and attitude. The results for several randomly selected employees are given below. 142) _____

Attitude (x)	59	63	65	69	58	77	76	69	70	64
Performance (y)	72	67	78	82	75	87	92	83	87	78

A) $y = 92.3 - 0.669x$

B) $y = 2.81 + 1.35x$

C) $y = 11.7 + 1.02x$

D) $y = -47.3 + 2.02x$

- 143) Two different tests are designed to measure employee productivity and dexterity. Several employees of a company are randomly selected and asked to complete the tests. The results are below. 143) _____

Dexterity (x)	23	25	28	21	21	25	26	30	34	36
Productivity (y)	49	53	59	42	47	53	55	63	67	75

A) $y = 10.7 + 1.53x$

B) $y = 2.36 + 2.03x$

C) $y = 75.3 - 0.329x$

D) $y = 5.05 + 1.91x$

- 144) In the table below, x represents the number of years since 2000 and y represents annual sales (in thousands of dollars) for a clothing company. 144) _____

Year x	0	1	3	5
Sales y	21	30	35	39

A) $y = 4.37x + 21.7$

B) $y = 3.31x + 23.8$

C) $y = 2.61x + 25.9$

D) $y = 5.18x + 20.6$

- 145) In the table below, x represents the number of years since 2000 and y represents the population (in thousands) of the town Boomville. 145) _____

Year x	1	2	3	4	5
Sales y	30	40	60	90	130

A) $y = 18x + 8$

B) $y = 25x - 5$

C) $y = 28x - 10$

D) $y = 12x + 20$

Solve the problem.

- 146) Find an equation for the least squares line representing weight, in pounds, as a function of height, in inches, of men. Then, predict the weight of a man who is 68 inches tall to the nearest tenth of a pound. The following data are the (height, weight) pairs for 8 men: (66, 150), (68, 160), (69, 166), (70, 175), (71, 181), (72, 191), (73, 198), (74, 206). 146) _____

A) 151.4 pounds

B) 165.1 pounds

C) 160.0 pounds

D) 161.2 pounds

- 147) Find an equation for the least squares line representing weight, in pounds, as a function of height, in inches, of men. Then, predict the height of a man who is 145 pounds to the nearest tenth of an inch. The following data are the (height, weight) pairs for 8 men: (66, 150), (68, 160), (69, 166), (70, 175), (71, 181), (72, 191), (73, 198), (74, 206). 147) _____

160), 175),
(69, (71,
166), 181),
(70, (72,191), 198),
(73, 198),
(74, 206).

191), (73, 147)
198), (74,
206).

- A) 65.7 inches B) 63.2 inches
C) 64.6 inches D) 68.2 inches

148) For some reason the quality of production decreases as the year progresses at a light bulb manufacturing plant. The following data represent the percentage of defective light bulbs produced at a light bulb manufacturing plant in the corresponding month of the year.

148) _____

month (x)	2	3	5	7	8	9	12
% defective (y)	1.3	1.6	2.0	2.4	2.6	2.8	3.1

Use the equation of the least squares line to predict the percentage of defective bulbs in June.

- A) 2.0% B) 2.3% C) 2.20% D) 2.15%

149) For some reason the quality of production decreases as the year progresses at a light bulb manufacturing plant. The following data represent the percentage of defective light bulbs produced at a light bulb manufacturing plant in the corresponding month of the year.

149) _____

month (x)	2	3	5	7	8	9	12
% defective (y)	1.3	1.6	2.0	2.4	2.6	2.8	3.1

Use the equation of the least squares line to predict in which month the percentage of defective light bulbs would be 1.83%.

- A) April B) May C) February D) March

150) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) when they entered the program were between 3.5 and 4.0. The following data were obtained regarding their GPAs on entering the program versus their current GPAs. Use the equation of the least squares line to predict the current GPA of a student whose entering GPA is 3.0.

150) _____

Entering GPA (x)	Current GPA(y)
3.5	3.6
3.8	3.7
3.6	3.9
3.6	3.6
3.5	3.9
3.9	3.8
4.0	3.7
3.9	3.9
3.5	3.8
3.7	4.0

- A) 3.38 B) 3.27 C) 3.76 D) 3.56

151) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test. Use the

equa of the
tion least

squares 151)
line to
predict
the score
on the
test of a
student
who
studies
7 hours.

-

Hours (x)	5	10	4	6	10	9
Score (y)	64	86	69	86	59	87

- A) 77.8 B) 79.8 C) 74.8 D) 69.8

152) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). Use the equation of the least squares line to predict the number of products sold if the cost of advertising is \$6000.

152) ____

Cost (x)	9	2	3	4	2	5	9	10
Number (y)	85	52	55	68	67	86	83	73

- A) 79.24 products sold B) 72.54 products sold
C) 16,795.8 products sold D) 69.54 products sold

153) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). Use the equation of the least squares line to predict the growth of a plant if the temperature is 69.

153) ____

Temp (x)	62	76	50	51	71	46	51	44	79
Growth (y)	36	39	50	13	33	33	17	6	16

- A) 29.16 mm B) 29.71 mm
C) 30.26 mm D) 27.71 mm

154) In the table below, x represents the number of years since 2000 and y represents annual sales (in thousands of dollars) for a clothing company. Use the least squares regression equation to estimate sales in the year 2006. Round to the nearest thousand dollars.

154) ____

Year (x)	1	2	3	4	5
Sales (y)	30	40	60	90	130

- A) \$147,000 B) \$140,000 C) \$142,000 D) \$145,000

155) A study was conducted to compare the average time spent in the lab each week versus course grade for computer students. The results are recorded in the table below. Use the equation of the least squares line to predict the grade of a student who spends 8 hours in the lab.

- of
hours
- spent
Num in lab
ber (x)

Grade
(percent)
(y)

89

7

155) _____

15

81

16

46

10

51

1

0

9

6

1

1

5

1

1

6

6

2

9

5

8

A) 75.3%

B) 80.6%

C) 73.7%

D) 69.7%

Provide an appropriate response.

- 156) Find k so that the line through $(3, k)$ and $(1, -2)$ is parallel to $4x - 5y = -1$. Find k so that the line is perpendicular to $4x + 3y = -9$. 156) _____
- A) $\frac{18}{5}$; $-\frac{1}{2}$ B) $\frac{18}{5}$; $-\frac{7}{2}$ C) $\frac{2}{5}$; $-\frac{7}{2}$ D) $\frac{2}{5}$; $-\frac{1}{2}$

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

- 157) John has been a teacher at West Side High School for the past 12 years. His salary during that time can be modeled by the linear equation $y = 800x + 33,000$ where x is the number of years since he began teaching at West Side and y is his salary in dollars. Explain what the slope, 800, represents in this context. 157) _____
- 158) If a company decides to make a new product, there are fixed costs and variable costs associated with this new product. Explain the differences of the two types of costs and why they occur. Use an example to illustrate your point. 158) _____
- 159) Give a definition or an example of the word or phrase: Undefined slope 159) _____
- 160) Why is the slope of a horizontal line equal to zero? Give an example. 160) _____
- 161) Explain what is wrong with the statement "The line has no slope." 161) _____
- 162) Why is the slope of a vertical line undefined? 162) _____
- 163) Can an equation of a vertical line be written in slope-intercept form? Explain. 163) _____
- 164) The total number of reported cases of AIDS in the United States has risen from 372 in 1981 to 100,000 in 1989 and 200,000 in 1992. Does a linear equation fit this data? Explain. 164) _____
- 165) Show that the points $P_1(2,4)$, $P_2(5,2)$, and $P_3(7,5)$ are the vertices of a right triangle. 165) _____

- 1) C
- 2) D
- 3) D
- 4) A
- 5) A
- 6) D
- 7) C
- 8) C
- 9) B
- 10) C
- 11) A
- 12) A
- 13) C
- 14) D
- 15) C
- 16) B
- 17) A
- 18) D
- 19) B
- 20) B
- 21) C
- 22) C
- 23) A
- 24) C
- 25) D
- 26) A
- 27) B
- 28) A
- 29) D
- 30) B
- 31) A
- 32) D
- 33) C
- 34) B
- 35) B
- 36) B
- 37) D
- 38) D
- 39) C
- 40) C
- 41) A
- 42) B
- 43) B
- 44) D
- 45) A
- 46) C
- 47) A
- 48) A
- 49) B
- 50) B
- 51) D

- 52) C
- 53) D
- 54) B
- 55) D
- 56) A
- 57) D
- 58) B
- 59) B
- 60) C
- 61) A
- 62) D
- 63) C
- 64) D
- 65) B
- 66) A
- 67) D
- 68) C
- 69) C
- 70) A
- 71) C
- 72) C
- 73) D
- 74) A
- 75) B
- 76) D
- 77) B
- 78) C
- 79) D
- 80) A
- 81) A
- 82) B
- 83) A
- 84) B
- 85) A
- 86) B
- 87) C
- 88) D
- 89) D
- 90) B
- 91) A
- 92) A
- 93) D
- 94) C
- 95) D
- 96) D
- 97) A
- 98) C
- 99) B
- 100) B
- 101) B
- 102) D
- 103) B

104) A
105) C
106) A
107) D
108) B
109) C
110) C
111) A
112) A
113) A
114) C
115) B
116) B
117) A
118) A
119) C
120) B
121) B
122) A
123) B
124) D
125) D
126) A
127) B
128) A
129) A
130) B
131) A
132) D
133) B
134) D
135) C
136) C
137) C
138) B
139) C
140) C
141) A
142) C
143) D
144) B
145) B
146) D
147) A
148) D
149) A
150) C
151) C
152) B
153) A
154) D
155) C

156) D

157) The slope of 800 indicates that during his 12 years at the school, John's salary has increased by approximately \$800 per year.

158) Fixed costs occur only once. These costs may be startup costs related to the production of the new product. Variable costs depend on how much product is made. These costs may consist of labor, material, and maintenance.

For example, a company decided to make oak filing cabinets. Fixed costs would include the costs of purchasing and renovating plant space and the cost of manufacturing equipment. Variable costs would include the cost labor and the cost of materials.

159) An equation such as $ax + c = 0$ has an undefined slope. (Answers may vary.)

160) Answers may vary. One possibility: The slope of a horizontal line is equal to zero because the y-values do not change as the x-values change. For example, the points (3, 4) and (7, 4)

$$\frac{4 - 4}{7 - 3} = \frac{0}{4} =$$

are two points on a horizontal line. The slope of this line is zero because $m = 0$.

161) Answers may vary. One possibility: It is not specific enough. The slope of a horizontal line is 0, while the slope of a vertical line is undefined.

162) Answers may vary. One possibility: Let (a, b) and (a, c), $b \neq c$, be any two different points

on a vertical line. The slope of the line = $\frac{y_1 - y_2}{x_1 - x_2} = \frac{b - c}{a - a} = \frac{b - c}{0}$. Division by zero is undefined.

163) No. In the slope-intercept form of the equation of a line, x is multiplied by slope; however, the slope of a vertical line is undefined. (Explanations will vary.)

164) No, the data cannot be modeled by a linear equation because the reported cases are not increasing at a constant rate. Assume a linear equation, and examine the slope of the two line segments. The slope of the segment from (0, 372) to (8, 100,000) is 12,453.5 while the slope of the segment from (8, 100,000) to (11, 200,000) is 33,333. $\bar{3}$. (Explanations will vary.)

165) Answers will vary. One possibility: The slope of the line through P_1 and P_2 is $-2/3$. The slope of the line through P_2 and P_3 is $3/2$. Therefore, since the product of these slopes is -1 , the lines are perpendicular and constitute a right angle in the triangle, making the triangle formed by these points a right triangle.