Exam

Name_____

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, 6) and (2, 5) 1) _____

A) $\frac{1}{5}$ B) $\frac{11}{9}$ C) $-\frac{1}{5}$ D) 5

2) (5, 1) and (7, -3) 2) _____

A) $-\frac{1}{6}$ B) 2 C) -2 D) $-\frac{1}{2}$

3) (6, -9) and (6, -5) 3) _____

A) Not defined B) 0 C) $-\frac{1}{3}$ D) $-\frac{7}{6}$

4) (-3, 3) and (-7, 3) 4) _____

A) $-\frac{3}{5}$ B) $-\frac{3}{2}$ C) 0 D) Not defined

5) (-2, 19) and (4, 14) 5) _____

A) $\frac{33}{2}$ B) $-\frac{5}{6}$ C) $-\frac{6}{5}$ D) $\frac{5}{6}$

Find the slope of the line.

6) $y = \frac{6}{7}x$ 6) _____

A) $\frac{6}{7}$ B) 0 C) 1 D) $\frac{7}{6}$

7) $y = 9x - 3$ 7) _____

A) 9 B) -9 C) 1 D) 0

8) $5x + 4y = 29$ 8) _____

A) $-\frac{5}{4}$ B) $\frac{29}{4}$ C) $\frac{5}{4}$ D) $\frac{4}{5}$

9) $5x - 2y = -27$ 9) _____

A) $-\frac{5}{2}$ B) $\frac{5}{2}$ C) $\frac{27}{2}$ D) $-\frac{2}{5}$

10) The x-axis 10) _____

A) 1 B) 0 C) Not defined D) -1

11) $x = 10$ 11) _____

A) Not defined B) 0 C) 1 D) 10

12) A line parallel to $-2y - 5x = -7$ 12) _____

A) $\frac{5}{2}$ B) $-\frac{5}{2}$ C) $\frac{7}{5}$ D) $-\frac{2}{5}$

13) A line parallel to $-2x = -3y + 11$ 13) _____

A) $\frac{3}{2}$ B) $-\frac{11}{2}$ C) $\frac{2}{3}$ D) $-\frac{2}{3}$

14) A line perpendicular to $-8x - 9y = 22$ 14) _____

A) $-\frac{9}{8}$ B) $\frac{9}{8}$ C) $\frac{8}{9}$ D) -8

15) A line perpendicular to $8x = 2y + 6$ 15) _____

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

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

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

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

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

A) $y = 2x + 21$ B) $y = -2x + 5$ C) $y = 2x - 3$ D) $y = -2x - 21$

18) Through (2, 0), $m = -1$ 18) _____

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

19) Through (3, -1), $m = -4$ 19) _____

A) $y = 4x + 11$ B) $y = -4x + 11$ C) $y = -4x - 13$ D) $y = 4x - 13$

20) Through (4, 3), $m = 0$ 20) _____

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

21) Through (6, -2), with undefined slope 21) _____

A) $y = -2$ B) $3x - 2y = 0$ C) $x = 6$ D) $\frac{1}{3}x + 6y = 0$

22) Through (4, 5), $m = -\frac{2}{3}$ 22) _____

A) $y = -\frac{2}{3}x + \frac{8}{3}$ B) $y = \frac{2}{3}x - \frac{23}{3}$ C) $y = \frac{2}{3}x + \frac{8}{3}$ D) $y = -\frac{2}{3}x + \frac{23}{3}$

23) Through (0, -6), $m = \frac{9}{2}$ 23) _____

A) $y = -\frac{9}{2}x + 6$ B) $y = -\frac{9}{2}x - 6$ C) $y = \frac{9}{2}x + 6$ D) $y = \frac{9}{2}x - 6$

24) Through (5, 5), $m = -\frac{2}{3}$ 24) _____

A) $y = -\frac{2}{3}x + \frac{25}{3}$ B) $y = \frac{2}{3}x - \frac{25}{3}$ C) $y = \frac{2}{3}x + \frac{10}{3}$ D) $y = -\frac{2}{3}x + \frac{10}{3}$

25) Through (-1, -4), $m = 2.5$ 25) _____

A) $y = 2.5x - 1.5$ B) $y = -2.5x - 6.5$ C) $y = 2.5x - 6.5$ D) $y = -2.5x - 1.5$

26) Through (-1, -4) and (5, 7) 26) _____

A) $y = -\frac{11}{6}x - \frac{35}{6}$ B) $y = \frac{11}{6}x - \frac{13}{6}$ C) $y = \frac{11}{6}x - \frac{50}{11}$ D) $y = \frac{6}{11}x - \frac{38}{11}$

27) Through (-5, -3) and (0, 8) 27) _____

A) $y = \frac{11}{5}x + 8$ B) $y = -\frac{11}{5}x + 8$ C) $y = \frac{1}{4}x + 8$ D) $y = -\frac{1}{4}x + 8$

28) Through (-6, 0) and (9, 7) 28) _____

A) $y = -3x + 34$ B) $y = -\frac{7}{15}x + \frac{14}{5}$ C) $y = \frac{7}{15}x + \frac{14}{5}$ D) $y = 3x + 34$

29) Through (8, -7) and (-2, 2) 29) _____

A) $y = -\frac{15}{4}x - \frac{11}{2}$ B) $y = \frac{15}{4}x - \frac{11}{2}$ C) $y = \frac{9}{10}x + \frac{1}{5}$ D) $y = -\frac{9}{10}x + \frac{1}{5}$

30) Through (3, -4) and (7, -7) 30) _____

A) $y = \frac{3}{4}x - \frac{7}{4}$ B) $y = -\frac{1}{2}x - \frac{21}{2}$ C) $y = -\frac{3}{4}x - \frac{7}{4}$ D) $y = \frac{1}{2}x - \frac{21}{2}$

31) Through $(-9, -2.5)$ and $(-4, 1.5)$ 31) _____

A) $y = 1.25x + 8.75$ B) $y = -0.8x - 9.7$

C) $y = 0.8x + 4.7$ D) $y = -1.25x - 13.75$

32) Through $(2, 7)$ and $(2, -6)$ 32) _____

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

33) Through $(3, -9)$ and $(9, -9)$ 33) _____

A) $y = -9$ B) $x = 3$ C) $-3x + 3y = 0$ D) $-\frac{1}{3}x + 9y = 0$

34) y-intercept 10, x-intercept 1 34) _____

A) $y = 10x + 10$ B) $y = -10x + 10$ C) $y = -\frac{1}{10}x + 1$ D) $y = \frac{1}{10}x + 1$

35) Through $(-6, -7)$, perpendicular to $7x + 3y = -63$ 35) _____

A) $y = \frac{3}{7}x$ B) $y = -\frac{3}{7}x + \frac{31}{7}$ C) $y = \frac{3}{7}x - \frac{31}{7}$ D) $y = \frac{7}{3}x + 31$

36) Through $(4, 8)$, parallel to $9x - 7y = 43$ 36) _____

A) $y = \frac{7}{9}x + \frac{8}{9}$ B) $y = \frac{4}{7}x - \frac{43}{7}$ C) $y = -\frac{9}{7}x - \frac{20}{7}$ D) $y = \frac{9}{7}x + \frac{20}{7}$

37) Through $(9, 14)$, parallel to $-9x + 5y = -46$ 37) _____

A) $y = \frac{9}{5}x - \frac{11}{5}$ B) $y = \frac{5}{9}x - \frac{14}{9}$ C) $y = -\frac{9}{5}x + \frac{11}{5}$ D) $y = -\frac{9}{5}x - \frac{46}{5}$

38) Through $(7, -1)$, perpendicular to $6x - 5y = 37$ 38) _____

A) $y = \frac{5}{6}x + \frac{29}{6}$ B) $y = -\frac{6}{5}x - \frac{6}{5}$ C) $y = -\frac{5}{6}x + \frac{29}{6}$ D) $y = -\frac{7}{5}x + \frac{37}{5}$

39) Through $(9, 4)$, perpendicular to $-8x + 9y = -36$ 39) _____

A) $y = -\frac{8}{9}x + 113$ B) $y = -\frac{9}{8}x$

C) $y = -\frac{9}{8}x + \frac{113}{8}$ D) $y = \frac{9}{8}x - \frac{113}{8}$

40) Through $(-8, 5)$, perpendicular to $x = -4$ 40) _____

A) $y = -5$ B) $y = -4$ C) $x = -4$ D) $y = 5$

41) The line with y-intercept -10 and perpendicular to $x + 2y = -9$ 41) _____

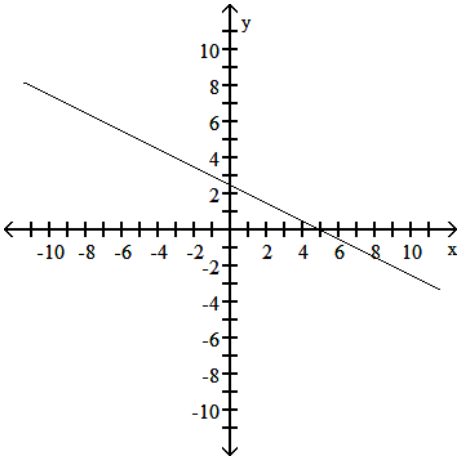
A) $y = \frac{1}{2}x - 10$ B) $y = -\frac{1}{2}x + 1$ C) $y = -2x - 10$ D) $y = 2x - 10$

42) The line with x-intercept -10 and perpendicular to $2x - y = 5$ 42) _____

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

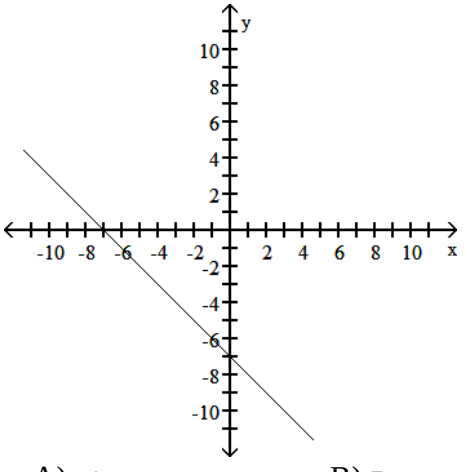
Find the slope of the line.

43) 43) _____



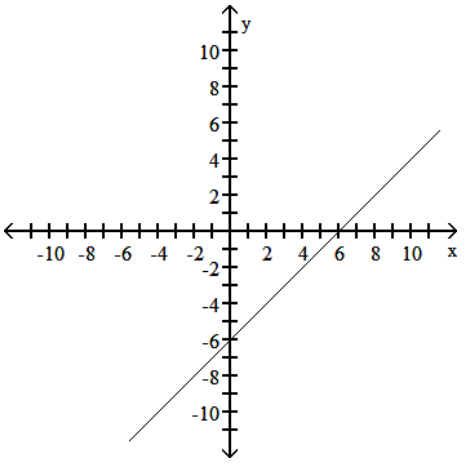
A) -2 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) 2

44) 44) _____



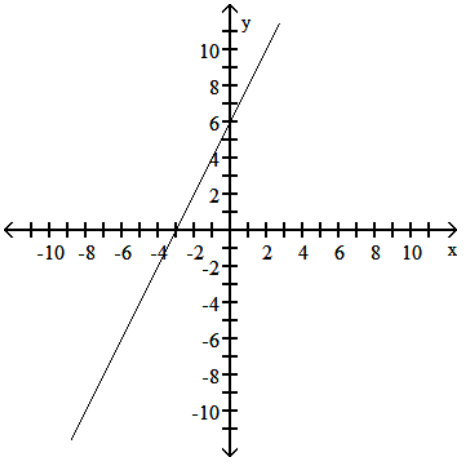
A) -1 B) 7 C) -7 D) 1

45) 45) _____



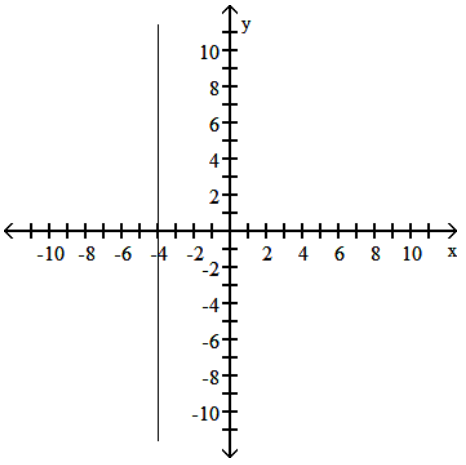
A) 6 B) 1 C) -6 D) -1

46) 46) _____



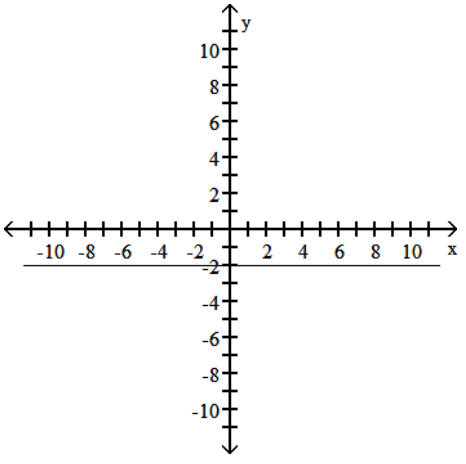
A) 2 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) -2

47) 47) _____



A) -4 B) undefined C) 0 D) $\frac{3}{2}$

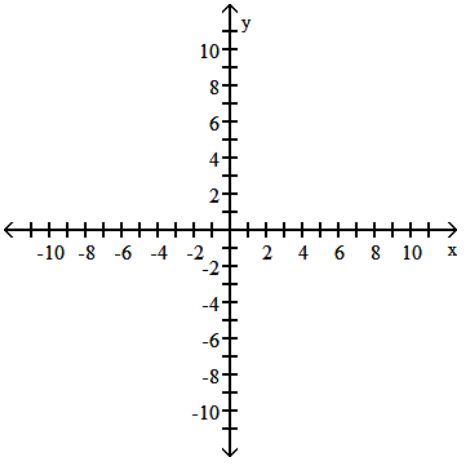
48) 48) _____



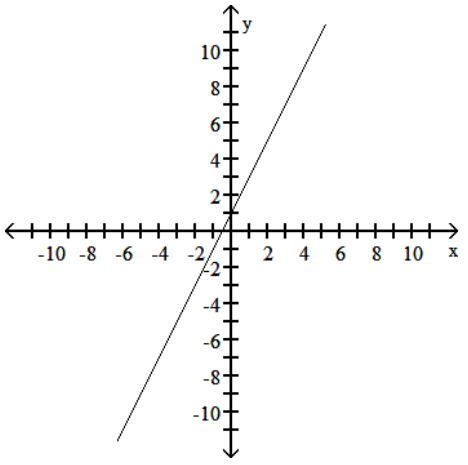
A) 2 B) 0 C) -2 D) undefined

Graph the equation.

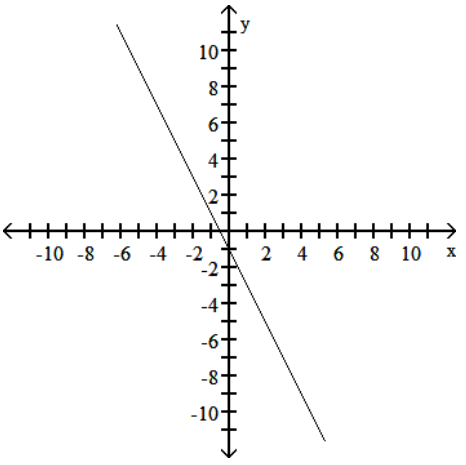
49) y = 2x - 1 49) _____



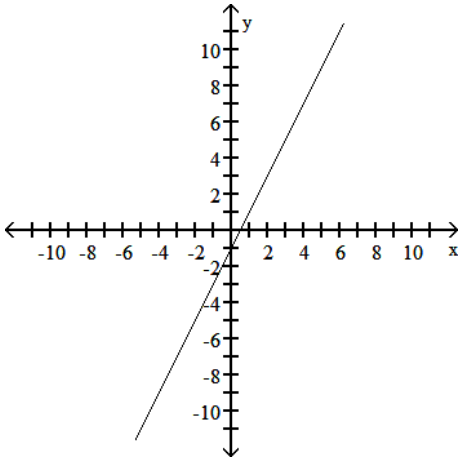
A)



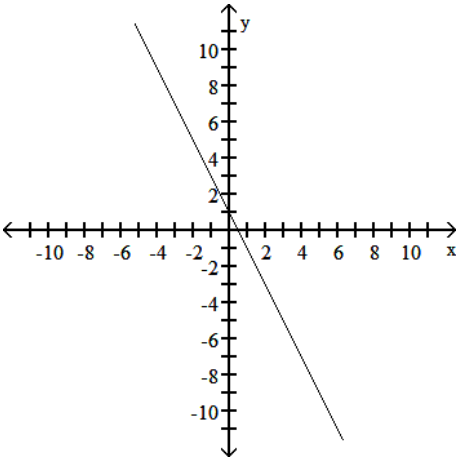
B)



C)

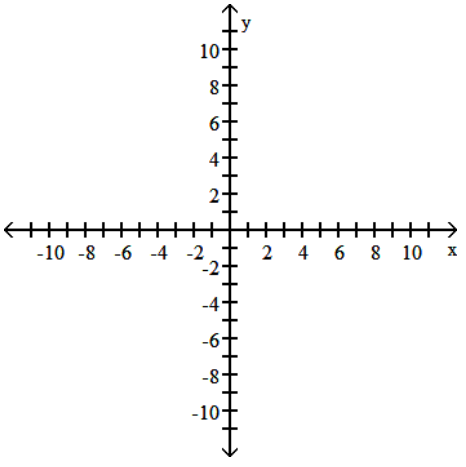


D)

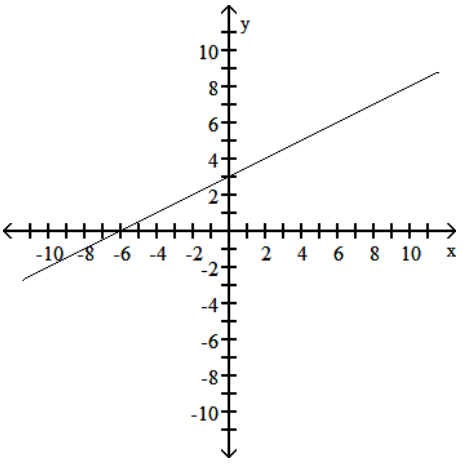


50) $y = -\frac{1}{2}x + 3$

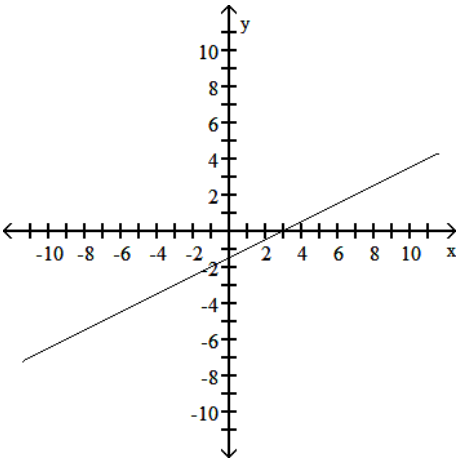
50) _____



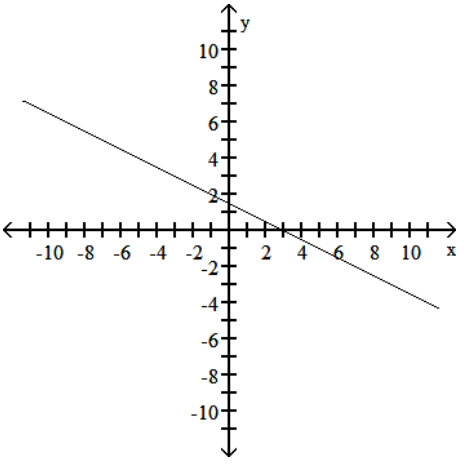
A)



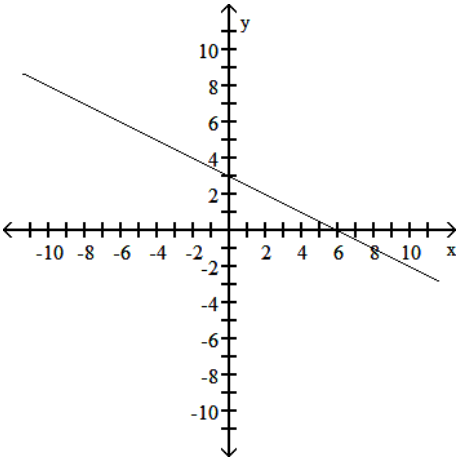
B)



C)

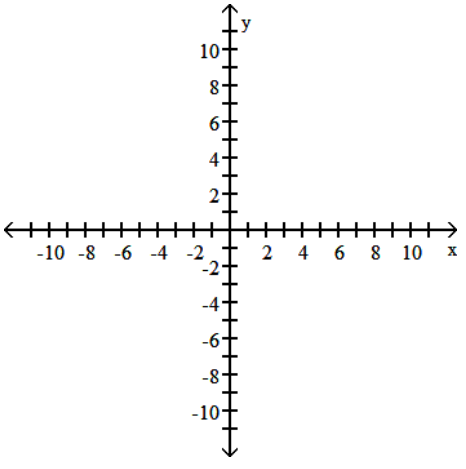


D)

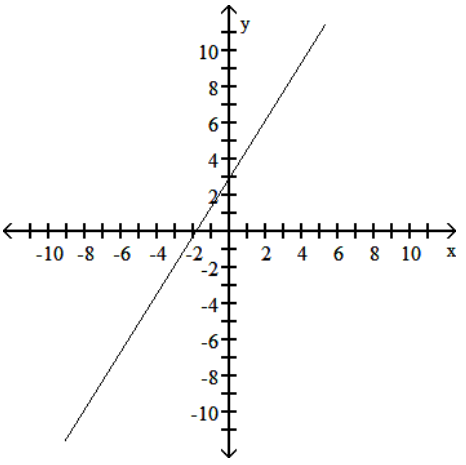


51) $5y + 8x = 15$

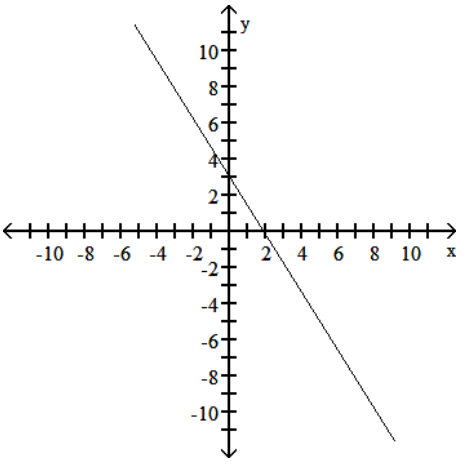
51) _____



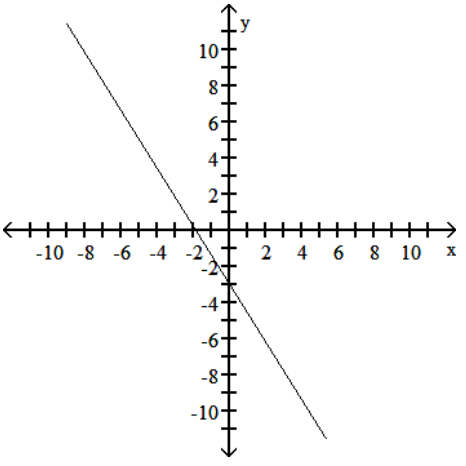
A)



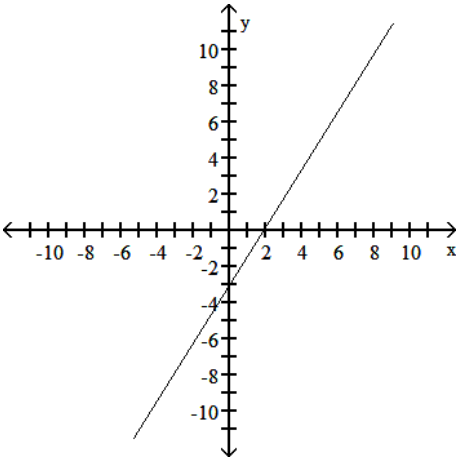
B)



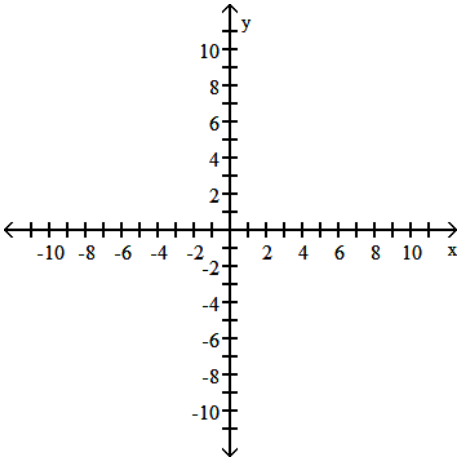
C)



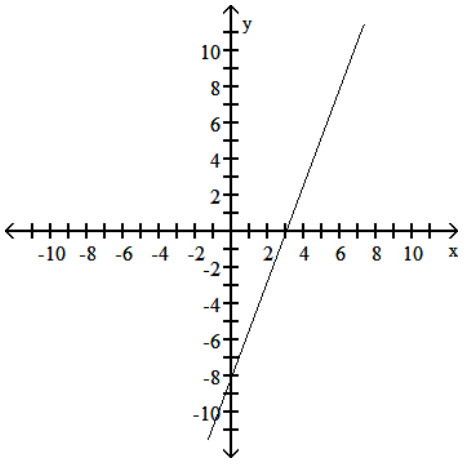
D)



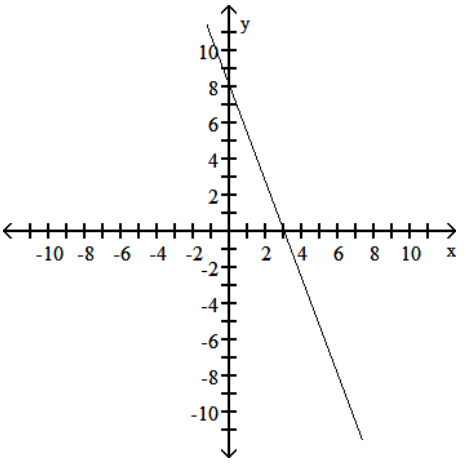
52) $3y - 8x = -24$ 52) _____



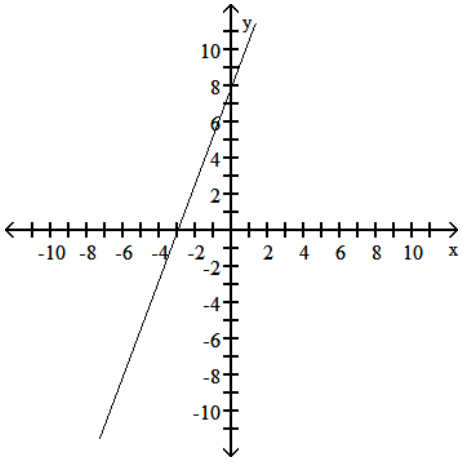
A)



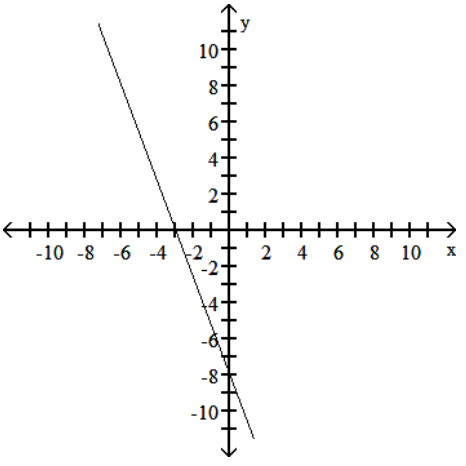
B)



C)

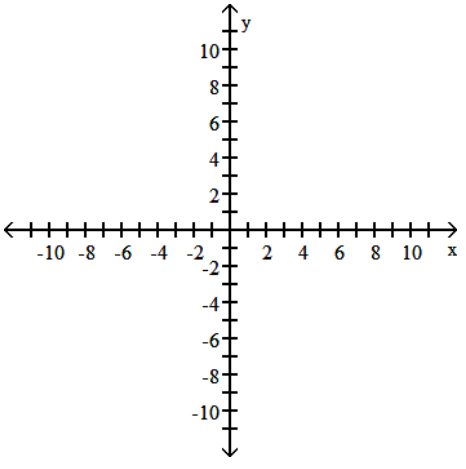


D)

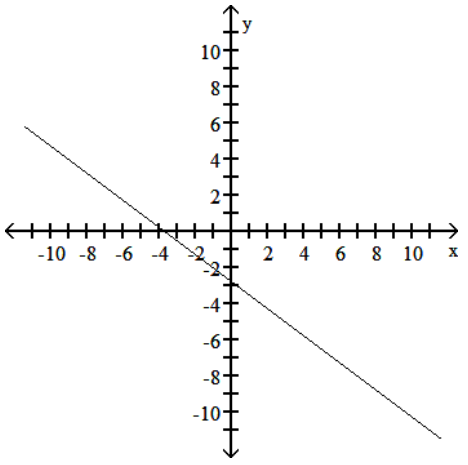


53) $3x + 4y = 11$

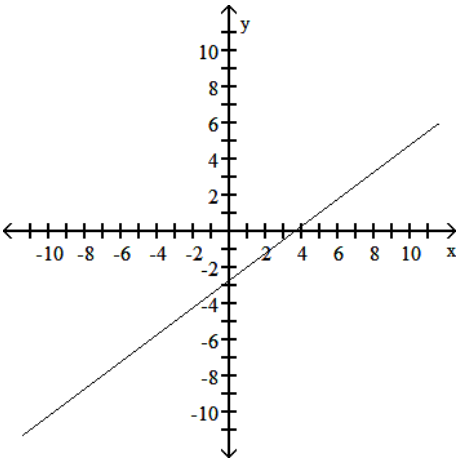
53) _____



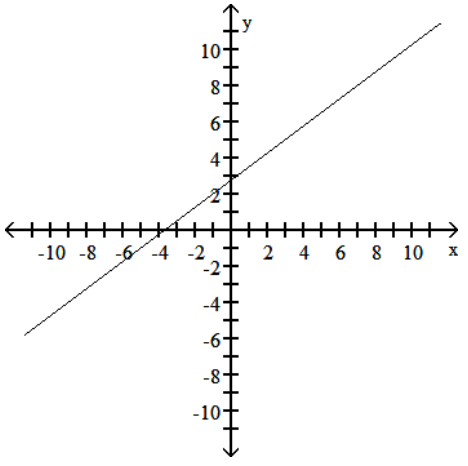
A)



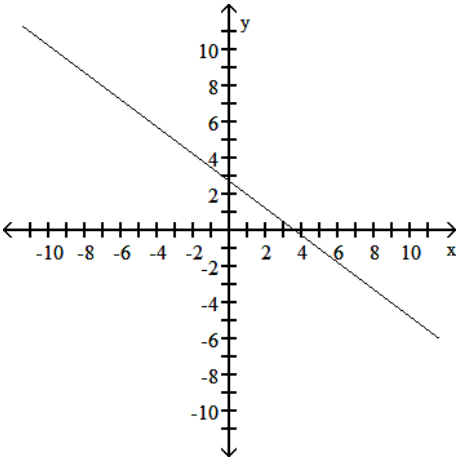
B)



C)

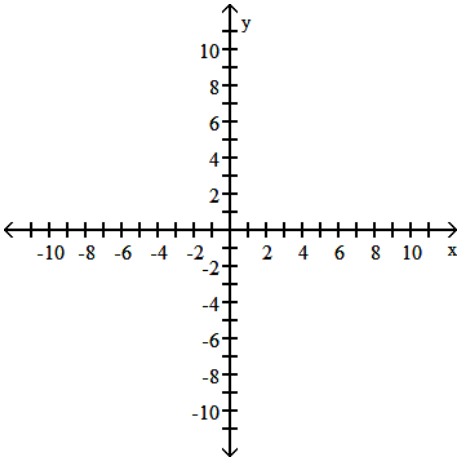


D)

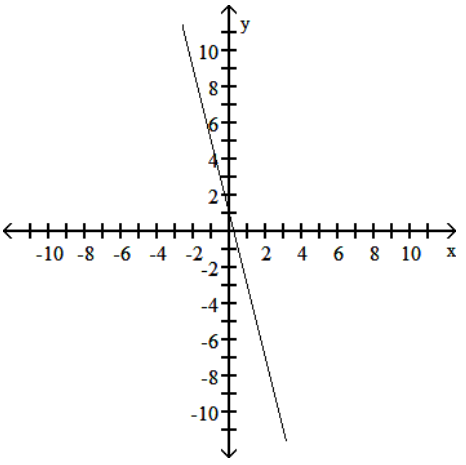


54) $4x + y = -1$

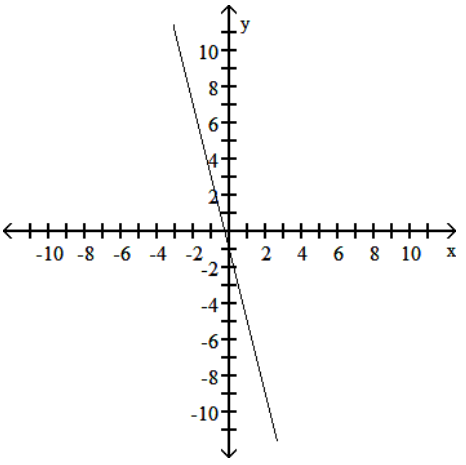
54) _____



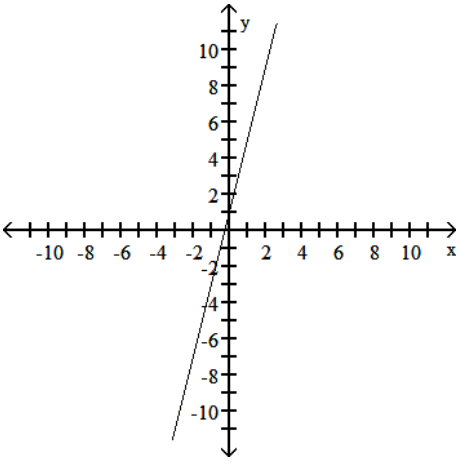
A)



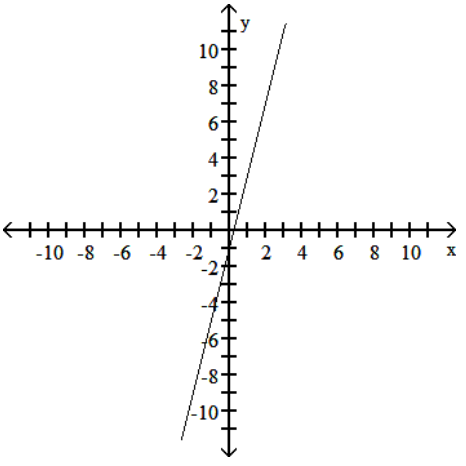
B)



C)

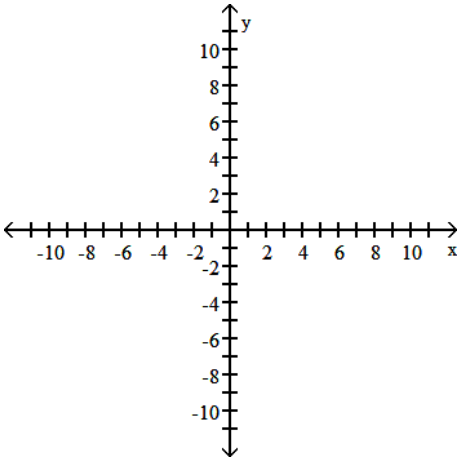


D)

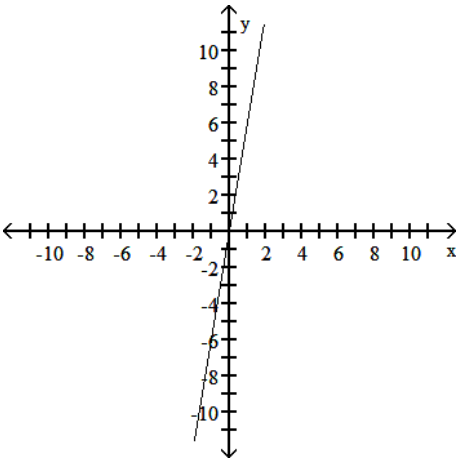


55) $6x - 12y = 0$

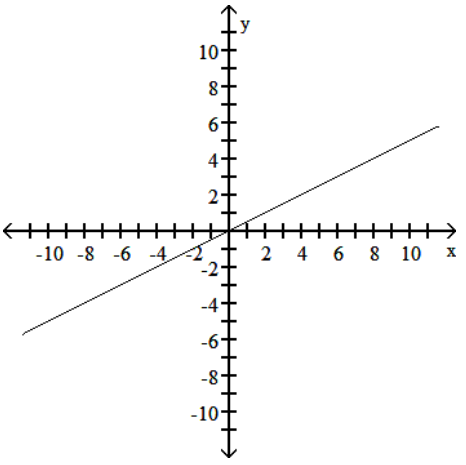
55) _____



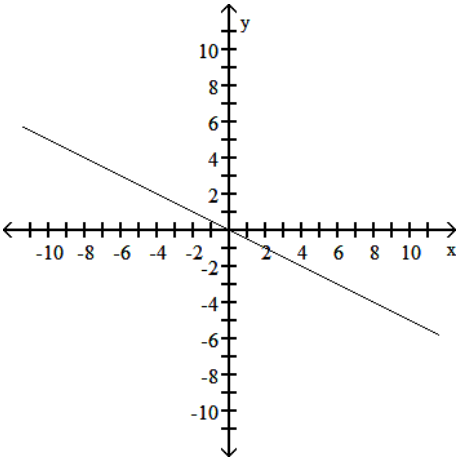
A)


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

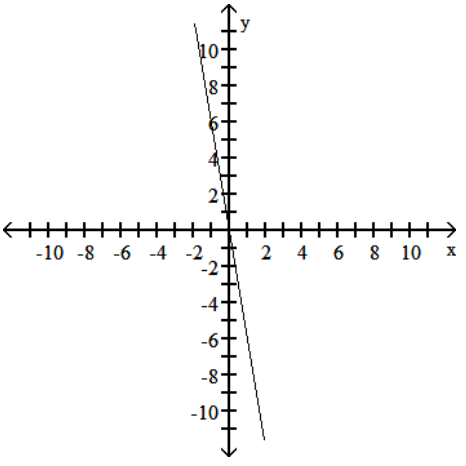
B)


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

C)

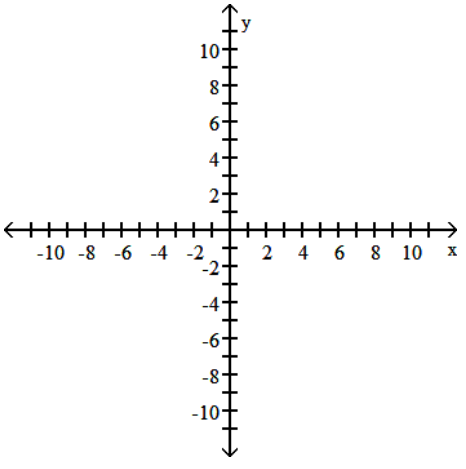

y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

D)

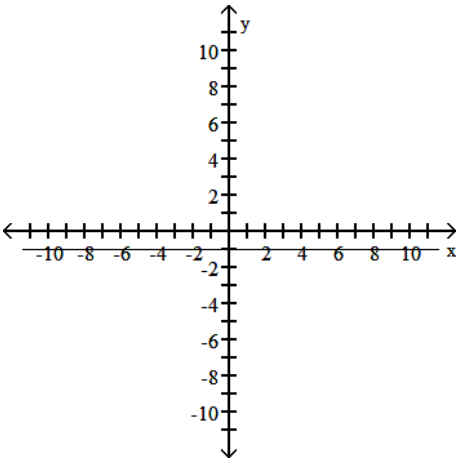

y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

56) x = -1

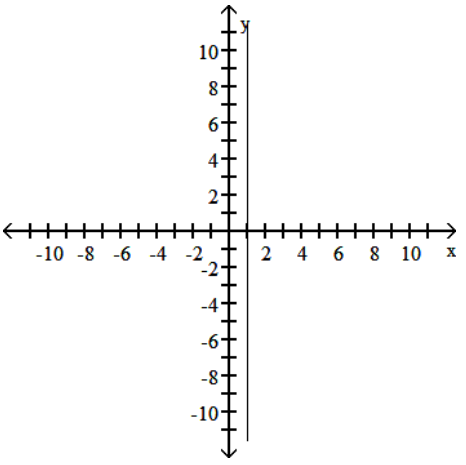
56) _____


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

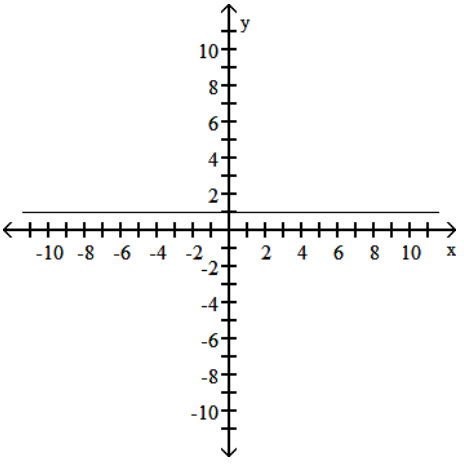
A)


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

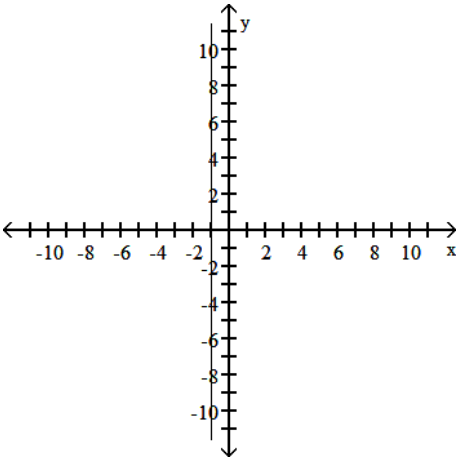
B)


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

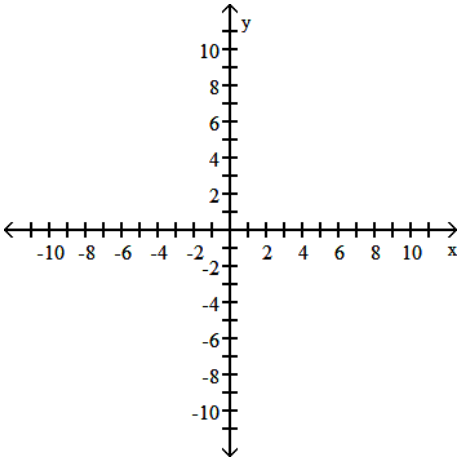
C)


y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

D)

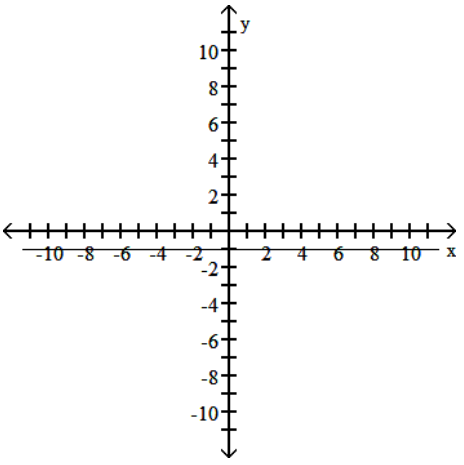

y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

57) y = 1

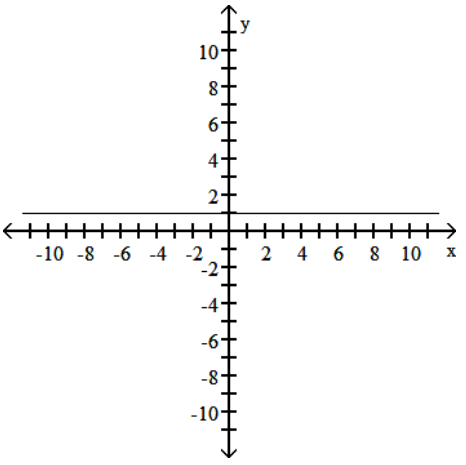

y
x
10
8
6
4
2
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 2 4 6 8 10

57) _____

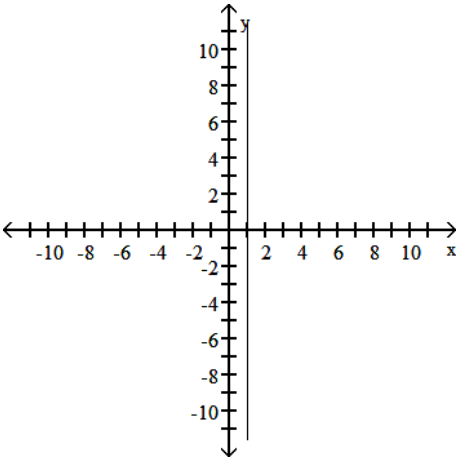
A)



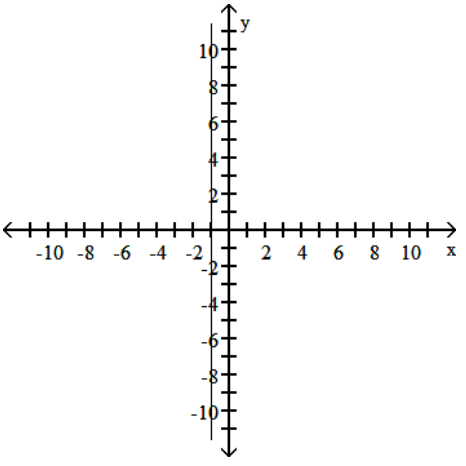
B)



C)

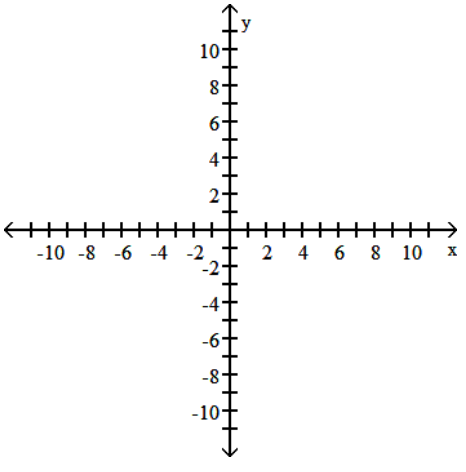


D)

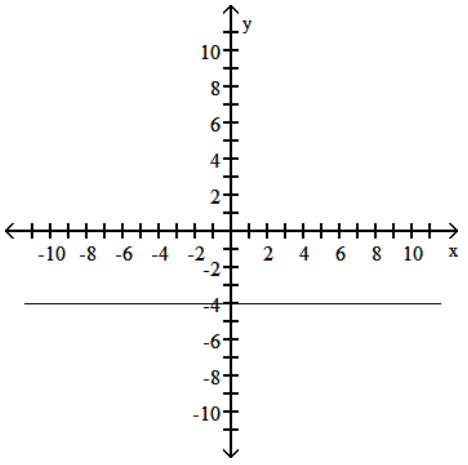


58) $x + 4 = 0$

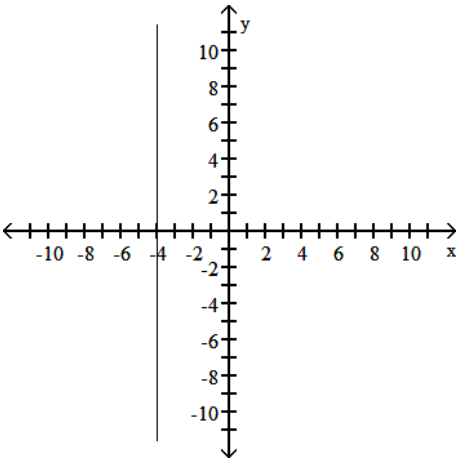
58) _____



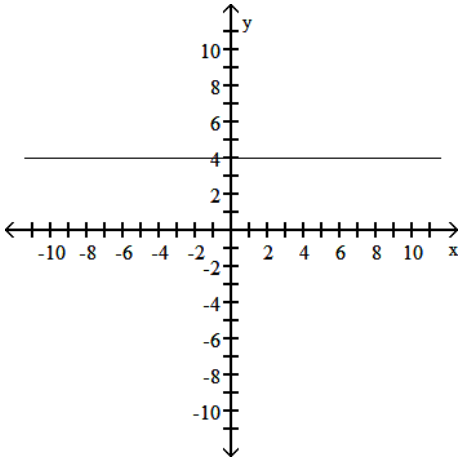
A)



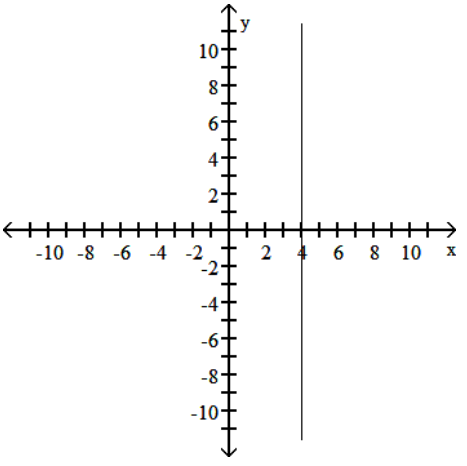
B)



C)

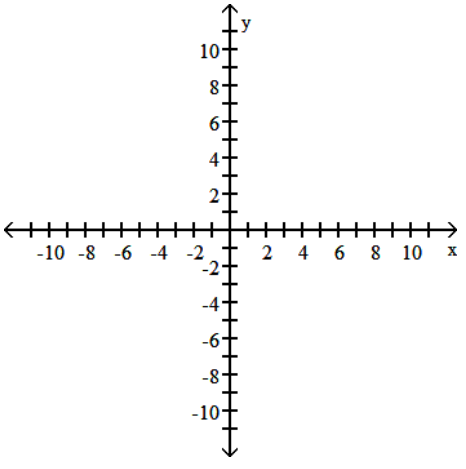


D)

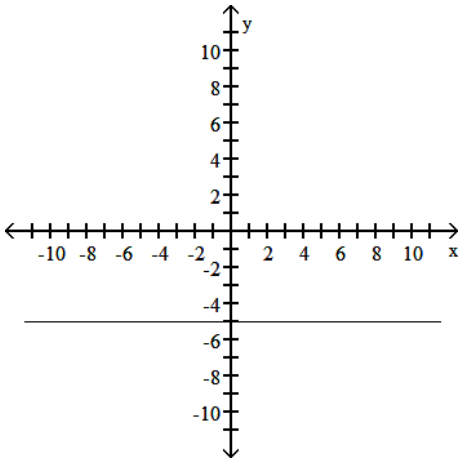


59) $y + 5 = 0$

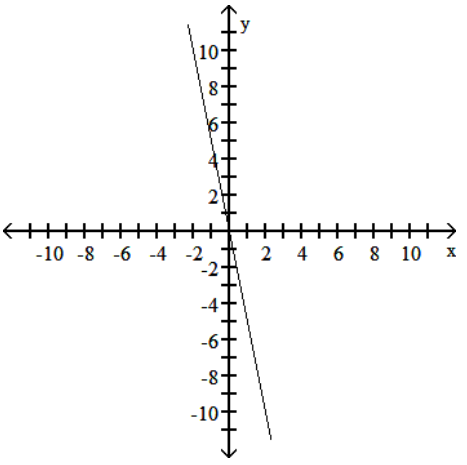
59) _____



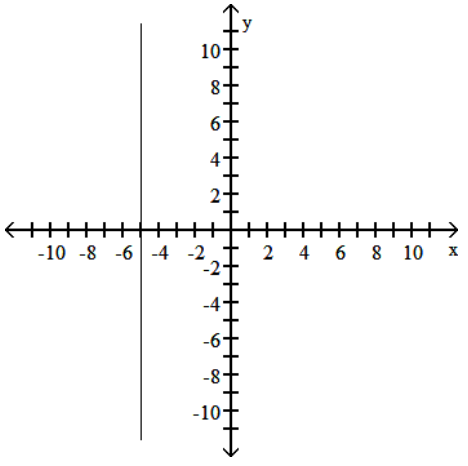
A)



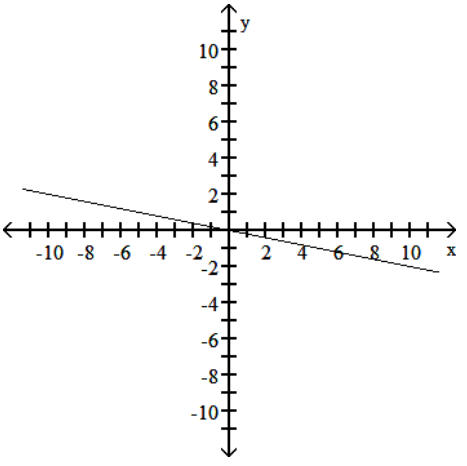
B)



C)



D)



Solve the problem.

60) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.60 as soon as you get in the taxi, to which a charge of $2.25 per mile is added. Find a linear equation that can be used to determine the cost, C, of an x-mile taxi ride. 60) _____

A) C = 4.85x
B) C = 2.60x + 2.25
C) C = 2.25x + 2.60
D) C = 3.35x

61) After two years on the job, an engineer's salary was $50,000. After seven years on the job, her salary was $56,000. Let y represent her salary after x years on the job. Assuming that the change in her salary over time can be approximated by a straight line, give an equation for this line in the form y = mx + b. 61) _____

A) y = 1200x + 50,000
B) y = 1200x + 47,600
C) y = 6,000x + 50,000
D) y = 6,000x + 38,000

62) Suppose that the population of a certain town, in thousands, was 105 in 1990 and 141 in 2002. Assume that the population growth can be approximated by a straight line. Find the equation of a line which will estimate the population of the town, in thousands, in any given year since 1990. 62) _____

A) y = 3x + 105 where x is the number of years since 1990

B) y = 4.25x + 90 where x is the number of years since 1990

C) y = 2.5x + 105 where x is the number of years since 1990

D) y = -3x + 177 where x is the number of years since 1990

63) Assume that the sales of a certain appliance dealer can be approximated by a straight line. Suppose that sales were $9,000 in 1982 and $80,000 in 1987. Let x = 0 represent 1982. Find the equation giving yearly sales S. 63) _____

A) S = 14,200x + 80,000

B) S = 71,000x + 80,000

C) S = 14,200x + 9,000

D) S = 71,000x + 9,000

64) The cost of owning a home includes both fixed costs and variable utility costs. Assume that it costs $5,042 per month for mortgage and insurance payments and it costs an average of $1.34 per unit for natural gas, electricity, and water usage. Determine a linear equation that computes the annual cost of owning this home if x utility units are used. 64) _____

A) y = 1.34x + 60,504

B) y = -1.34x + 60,504

C) y = -1.34x + 5,042

D) y = 1.34x + 5,042

65) In a lab experiment 10 grams of acid were produced in 10 minutes and 19 grams in 38 minutes. Let y be the grams produced in x minutes. Write a linear equation for grams produced. 65) _____

A) $y = \frac{9}{28}x + \frac{95}{14}$ B) $y = -\frac{9}{28}x - \frac{95}{14}$ C) $y = \frac{28}{9}x - \frac{95}{14}$ D) $y = \frac{9}{28}x - \frac{95}{14}$

66) A biologist recorded 15 snakes on 16 acres in one area and 20 snakes on 19 acres in another area. Let y be the number of snakes in x acres. Write a linear equation for the number of snakes. 66) _____

A) $y = \frac{5}{3}x + \frac{35}{3}$ B) $y = \frac{3}{5}x + \frac{35}{3}$ C) $y = -\frac{5}{3}x + \frac{35}{3}$ D) $y = \frac{5}{3}x - \frac{35}{3}$

67) 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). 67) _____

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 = 1.59x - 9.11

B) y = 0.629x + 5.73

C) y = 0.629x + 6.38

D) y = 1.59x - 10.2

68) 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, 24,300) and (3, 26,800). 68) _____

Year, x	Salary, y
1990, 0	$23,500
1991, 1	$24,300
1992, 2	$25,200
1993, 3	$26,800
1994, 4	$27,200

A) y = 29.3x + 23,050
B) y = 1,250x
C) y = -1,493x + 23,050
D) y = 1,250x + 23,050

69) 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 $55,000? 69) _____

A) 4 years B) 7 years C) 6 years D) 5 years

70) 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 21.0 thousand dollars. 70) _____

A) 22.523 thousand dollars
B) 25.427 thousand dollars
C) 17.835 thousand dollars
D) 15.015 thousand dollars

71) Suppose the sales of a particular brand of appliance satisfy the relationship S = 100x + 5,000, where S represents the number of sales in year x, with x = 0 corresponding to 1982. Find the number of sales in 1993. 71) _____

A) 6,100 sales B) 12,100 sales C) 6,000 sales D) 12,200 sales

72) The mathematical model C = 600x + 20,000 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 400 items? 72) _____

A) $260,000 B) $0.08 C) $240,000 D) $33.33

73) Suppose the function y = 1.1t - 4.2 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 = 30 minutes. 73) _____

A) 28.8 min B) 34.62 min C) 25.38 min D) 37.2 min

74) A car rental company charges $23 per day to rent a particular type of car and $0.19 per mile. Juan is charged $52.45 for a one-day rental. How many miles did he drive? 74) _____

A) 170 mi B) 276 mi C) 155 mi D) 253 mi

75) 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 = 7.1 seconds. 75) _____

A) 235.2 feet per second B) 236.5 feet per second

C) 238.5 feet per second D) 237.2 feet per second

76) 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, 24,200) and (3, 26,500). Then use this function to predict the salary for the year 2002. 76) _____

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

A) $37,340 B) $37,320 C) $37,300 D) $37,280

77) 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 82 on the one-hour exams, and 141 on the midterm exam, what is the minimum score on the final exam that the person can get and still earn a B? 77) _____

A) 587 B) 317 C) 407 D) 452

Evaluate the function as indicated.

78) Find f(18) when f(x) = 14x + 7. 78) _____

A) 252.7 B) 259 C) -245 D) 245

79) Find f(3) when f(x) = -4x - 6. 79) _____

A) -6 B) -18 C) -30 D) -10

80) Find f(0) when f(x) = 16x + 14. 80) _____

A) 14 B) 30 C) 0 D) 16

81) Find f(5.9) when f(x) = -7.4x - 10. 81) _____

A) -33.66 B) 33.66 C) -53.66 D) -44.66

82) Find f(8.4) when f(x) = 3x + 1.0. 82) _____

A) -24.2 B) 25.3 C) 24.2 D) 26.2

83) Find $g\left(-\frac{7}{9}\right)$ when g(x) = 7 - 5x. 83) _____

A) $\frac{98}{9}$ B) 0 C) $-\frac{98}{9}$ D) $\frac{28}{9}$

84) Find f(-6.1) when f(x) = 7. 84) _____

A) -42.7 B) -7 C) 7 D) -6.1

85) Find f(-r) when f(x) = 6 - 2x. 85) _____

A) 6 + rx B) r - 2x C) 6 + 2r D) 6 - 2r

86) Find g(k^2) when g(x) = -5 - 5x. 86) _____

A) -5 + k^2 B) -5 + -5k^2 C) -5 + 5k^2 D) -5 - 5x^2

87) Find g(a - 1) when g(x) = 3x - 4. 87) _____

A) 3a - 4 B) 3a - 7 C) 3a + 1 D) $\frac{1}{3}$a - 4

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

88) 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. 88) _____

A) C(x) = 35x + 30 B) C(x) = 35x - 30 C) C(x) = 30x + 35 D) C(x) = 30x - 35

89) A cab company charges a base rate of $1.50 plus 15 cents per minute. Let C(x) be the cost in dollars of using the cab for x minutes. 89) _____

A) C(x) = 1.50x - 0.15 B) C(x) = 0.15x + 1.50

C) C(x) = 1.50x + 0.15 D) C(x) = 0.15x - 1.50

90) An electrician charges a fee of $55 plus $40 per hour. Let C(x) be the cost in dollars of using the electrician for x hours. 90) _____

A) C(x) = 55x - 40 B) C(x) = 40x - 55 C) C(x) = 55x + 40 D) C(x) = 40x + 55

91) A cable TV company charges $23 for the basic service plus $7 for each movie channel. Let C(x) be the total cost in dollars of subscribing to cable TV, using x movie channels. 91) _____

A) C(x) = 23x - 7 B) C(x) = 23x + 7 C) C(x) = 7x - 23 D) C(x) = 7x + 23

92) Fixed cost, $30; 5 items cost $3,060 to produce 92) _____

A) C(x) = 606x + 30 B) C(x) = 1,212x + 30

C) C(x) = 606x + 3,060 D) C(x) = 1,212x + 3,060

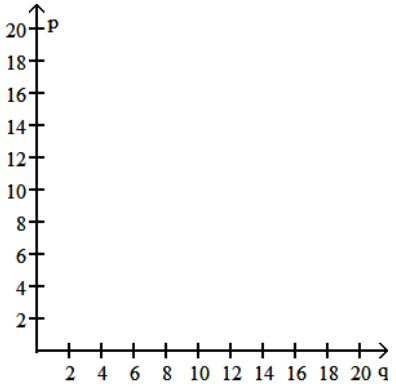
93) Marginal cost, $20; 70 items cost $2,300 to produce 93) _____

A) C(x) = 13x + 900 B) C(x) = 13x + 2,300

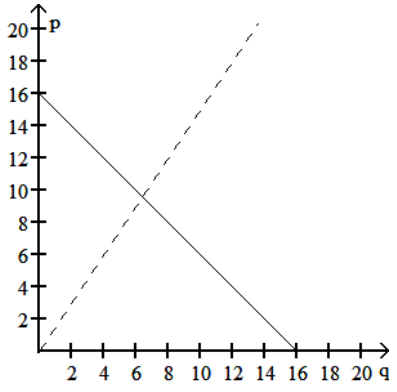
C) C(x) = 20x + 900 D) C(x) = 20x + 2,300

Solve the problem.

94) Let the supply and demand functions for a certain model of electric pencil sharpener be given by $p = S(q) = \frac{2}{3}q$ and $p = D(q) = 16 - \frac{2}{3}q$, 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. 94) _____

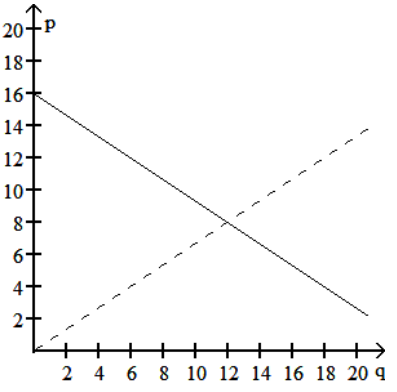


A)



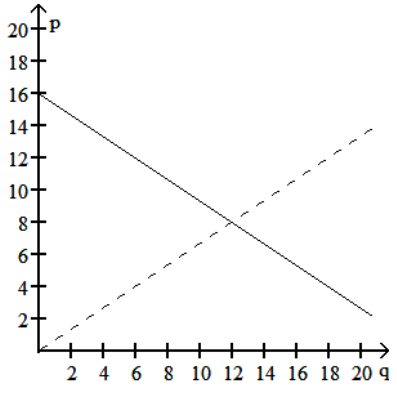
Equilibrium quantity: 640
Equilibrium price: $9.60

B)



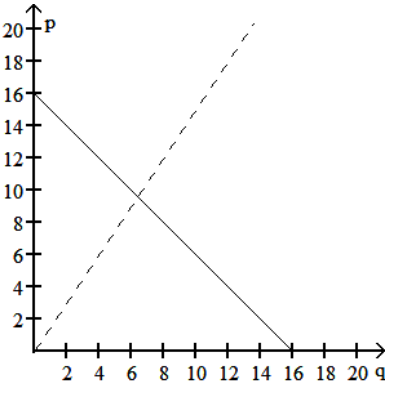
Equilibrium quantity: 950
Equilibrium price: $7

C)



Equilibrium quantity: 1,200
Equilibrium price: $8

D)

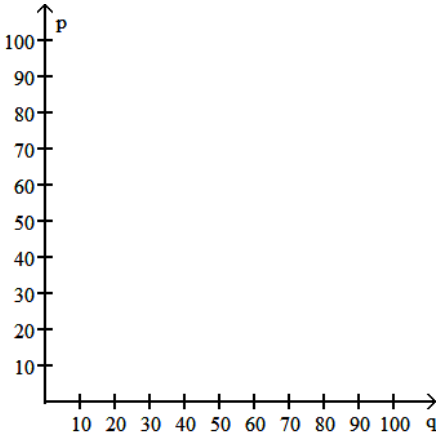


Equilibrium quantity: 960
Equilibrium price: $6.40

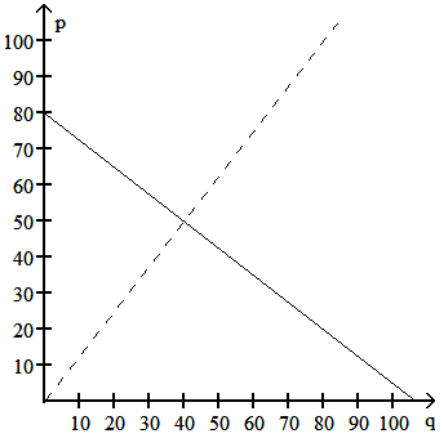
95) Let the supply and demand functions for raspberry-flavored licorice be given by 95) _____

$p = S(q) = \frac{5}{4}q$ and $p = D(q) = 80 - \frac{5}{4}q$,

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.

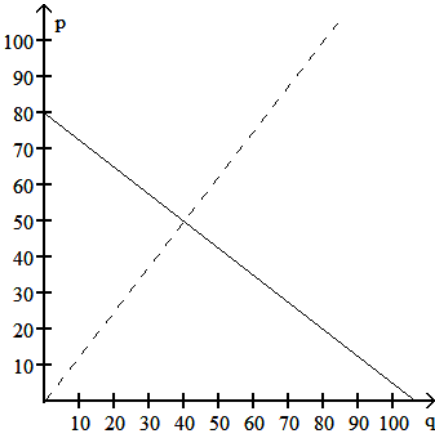


A)



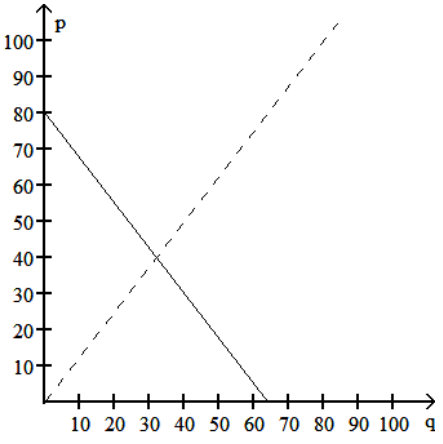
Equilibrium quantity: 40
Equilibrium price: $50.00

B)



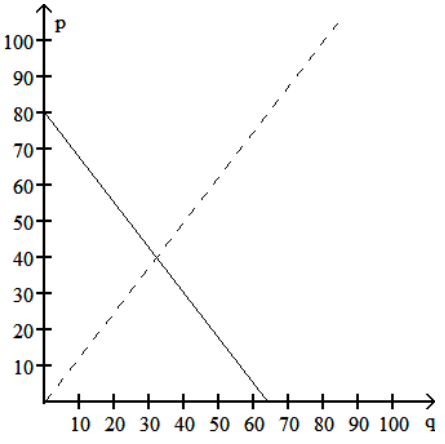
Equilibrium quantity: 50.00
Equilibrium price: $40

C)



Equilibrium quantity: 32
Equilibrium price: $40.00

D)



Equilibrium quantity: 40.00
Equilibrium price: $32

96) Given the supply and demand functions below, find the price when the demand is 145. 96) _____
S(p) = 9p + 12
D(p) = 280 - 9p
A) $47 B) $15 C) $1317 D) $292

97) Suppose that the demand and price for a certain model of graphing calculator are related by p = D(q) = 113 - 1.5q, where p is the price (in dollars) and q is the demand (in hundreds). Find the price if the demand is 500 calculators. 97) _____
A) $188.00 B) $38.00 C) $120.50 D) $105.50

98) Given the supply and demand functions below, find the demand when p = $12. 98) _____
S(p) = 5p
D(p) = 120 - 4p
A) 72 B) 132 C) 48 D) 60

99) Suppose that the demand and price for a certain model of graphing calculator are related by p = D(q) = 92 - 3.25q, where p is the price (in dollars) and q is the demand (in hundreds). Find the demand for the calculator if the price is $34. Round to the nearest whole number if necessary. 99) _____
A) 446 calculators B) 18 calculators
C) 23,200 calculators D) 1,785 calculators

100) Suppose that the price and supply for a certain model of graphing calculator are related by p = S(q) = 4.5q, where p is the price (in dollars) and q is the supply (in hundreds) of calculators. Find the supply if the price is $99. Round to the nearest whole number if necessary. 100) _____
A) 220 calculators B) 2,200 calculators
C) 1,100 calculators D) 550 calculators

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. 101) _____
D(p) = 4,600 - 70p
S(p) = 130p
A) $60; 400 B) $23; 2,990 C) $60; 2,990 D) $35; 2,150

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) = 108,900 - 290p
S(p) = 370p
A) $80; 85,700 B) $294; 23,640 C) $80; 61,050 D) $165; 61,050

103) 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. 103) _____
D(p) = 4,704 - 50p
S(p) = 230p - 1,176
A) $32; 3,104 B) $21; 3,654 C) $25; 3,654 D) $25; 3,454

104) A book publisher found that the cost to produce 1000 calculus textbooks is $25,100, while the cost to produce 2000 calculus textbooks is $51,700. 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? 104) ____

A) $2.66 B) $26.60 C) $26,600.00 D) $0.03

105) 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 $5,340 and the cost to produce 15,000 bags as $7,910. Find the marginal cost of the bags of microwave popcorn to be produced in this plant. 105) ____

A) $2,570.00 B) $0.51 C) $5.14 D) $51.40

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 $61 per toilet. The company expects to sell the toilets for $152. 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. 106) ____

A) C(x) = 61x; R(x) = 152x
B) C(x) = 16,661; R(x) = 152
C) C(x) = 16600 + 152x; R(x) = 61x
D) C(x) = 16600 + 61x; R(x) = 152x

107) 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 $64 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. 107) ____

A) P(x) = 88x - 16600
B) P(x) = 152x - 16600
C) P(x) = 88x
D) P(x) = 88x + 16600

108) 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 $39 per pair of shoes. The shoes will sell for $104 for each pair. What is the profit if 600 pairs are sold? 108) ____

A) $39,000 B) $15,000 C) $63,000 D) $61,800

109) Midtown Delivery Service delivers packages which cost $1.60 per package to deliver. The fixed cost to run the delivery truck is $201 per day. If the company charges $4.60 per package, how many packages must be delivered daily to make a profit of $51? 109) ____

A) 67 packages B) 32 packages C) 84 packages D) 125 packages

110) Regrind, Inc. regrinds used typewriter platens. The cost per platen is $1.60. The cost to regrind 110 platens is $600. Find the linear cost function to regrind platens. If reground platens sell for $8.50 each, how many must be reground and sold to break even? 110) ____

A) C(x) = 1.60x + 424
break-even = 61
B) C(x) = 1.60x + 600
break-even = 60
C) C(x) = 1.60x + 600
break-even = 88
D) C(x) = 1.60x + 424
break-even = 430

111) Regrind, Inc. regrinds used typewriter platens. The cost per platen is $2.00. The fixed cost to run the grinding machine is $215 per day. If the company sells the reground platens for $7.00, how many must be reground daily to break even? 111) ____

A) 43 platens B) 23 platens C) 28 platens D) 107 platens

112) Northwest Molded molds plastic handles which cost $1.00 per handle to mold. The fixed cost to run the molding machine is $2,054 per week. If the company sells the handles for $3.00 each, how many handles must be molded weekly to break even? 112) ____

A) 2,054 handles B) 684 handles C) 1,027 handles D) 513 handles

113) Midtown Delivery Service delivers packages which cost $1.90 per package to deliver. The fixed cost to run the delivery truck is $84 per day. If the company charges $8.90 per package, how many packages must be delivered daily to break even? 113) ____

A) 44 packages B) 8 packages C) 12 packages D) 7 packages

114) A lumber yard has fixed costs of $4,681.30 a day and variable costs of $1.00 per board-foot produced. The company gets $2.30 per board-foot sold. How many board-feet must be produced daily to break even? 114) ____

A) 2,400 board-feet B) 1,418 board-feet

C) 3,601 board-feet D) 4,681 board-feet

115) 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 $36 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? 115) ____

A) 348 pairs B) 229 pairs C) 69 pairs D) 667 pairs

116) 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.) 116) ____

A) 73 miles per hour B) 48 miles per hour

C) 98 miles per hour D) 149 miles per hour

117) 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 9 degrees? (Round to the nearest foot.) 117) ____

A) 67 feet B) 30 feet C) 45 feet D) 12 feet

118) The bank's temperature display shows that it is 23° Celsius. What is the temperature in Fahrenheit? 118) ____

A) 73.4° B) -5.0° C) 30.6° D) 99.0°

119) On a summer day, the surface water of a lake is at a temperature of 27° Celsius. What is this temperature in Fahrenheit? 119) ____

A) 27° B) 48.6° C) 59° D) 80.6°

120) On a summer day, the bottom water of a lake is at a temperature of 9° Celsius. What is this temperature in Fahrenheit? 120) ____

A) 9° B) 41° C) 16.2° D) 48.2°

121) The outdoor temperature rises to 27° Fahrenheit. What is this temperature in Celsius? 121) ____

A) 15° B) -2.8° C) -5° D) 27°

122) A meteorologist in the Upper Peninsula of Michigan predicts an overnight low of -13° Fahrenheit. What would a Canadian meteorologist predict for the same location in Celsius? 122) ____

A) -25° B) -13° C) -7.2° D) -45°

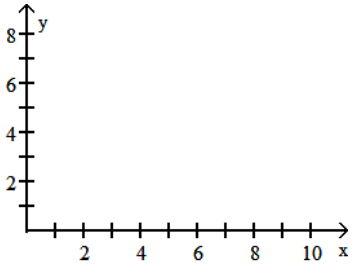
123) Find the temperature at which the Celsius and Fahrenheit scales coincide. 123) ____

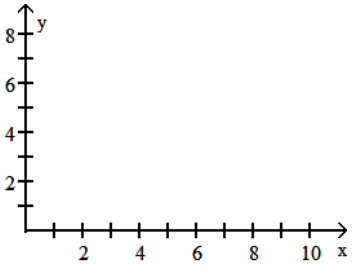
A) 40° B) 0° C) -40° D) -24°

124) For the following table of data, 124) ____

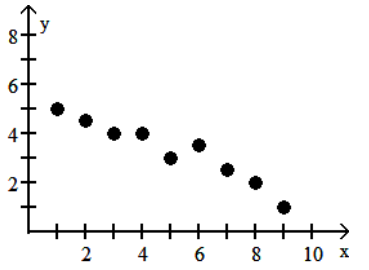
a. Draw a scatterplot.
b. Calculate the correlation coefficient.
c. Calculate the least squares line and graph it on the scatterplot.
d. Predict the y-value when x is 18.

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



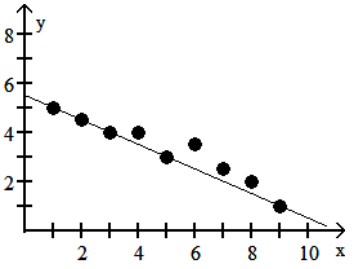


A) a.



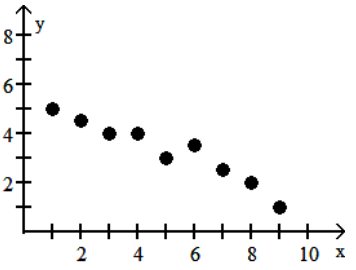
b. 0.965

c. Y = -0.45x + 5.53



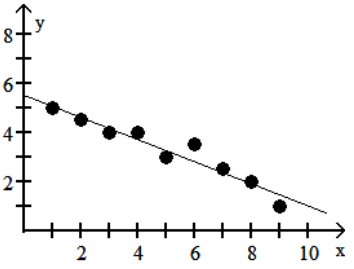
d. -2.57

B) a.



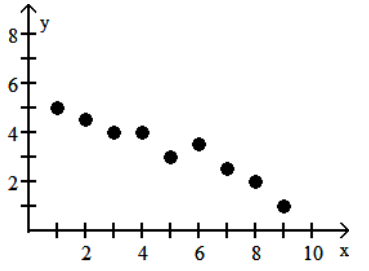
b. -0.965

c. Y = -0.45x + 5.53



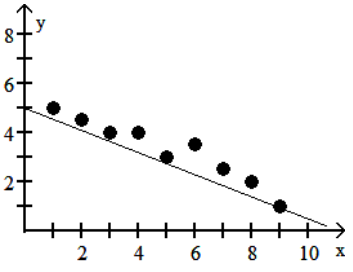
d. -2.57

C) a.



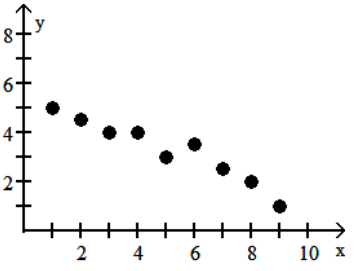
b. -0.965

c. Y = -0.45x - 5.53



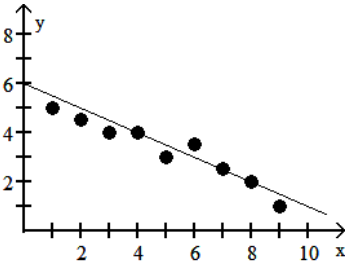
d. -13.63

D) a.



b. 0.965

c. Y = 0.45x - 5.53

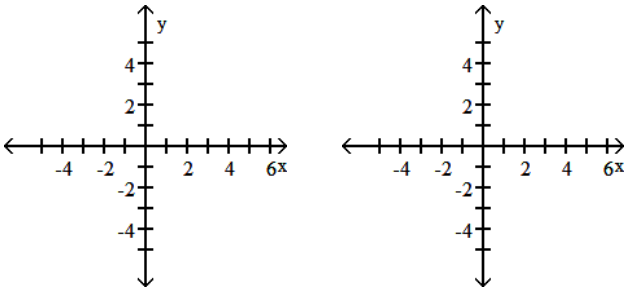


d. 2.57

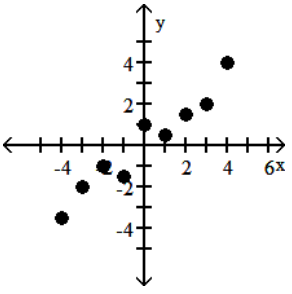
125) For the following table of data, 125) ____

a. Draw a scatterplot.
b. Calculate the correlation coefficient.
c. Calculate the least squares line and graph it on the scatterplot.
d. Predict the y-value when x is -26.

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

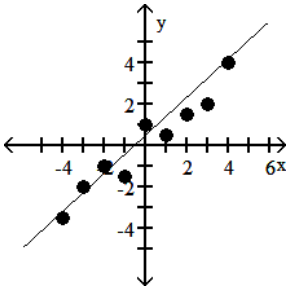


A) a.



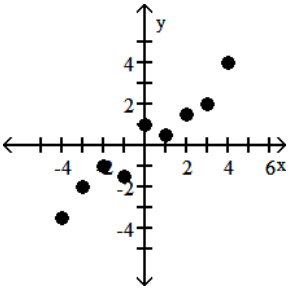
b. 0.966

c. Y = 0.82x - 0.11



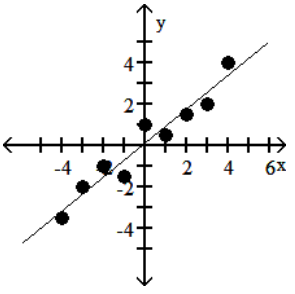
d. -21.43

B) a.



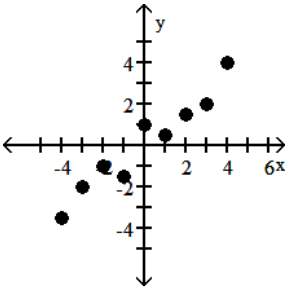
b. 0.966

c. Y = 0.82x + 0.11



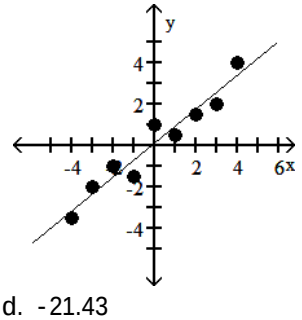
d. -21.21

C) a.



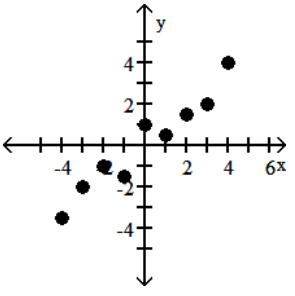
b. -0.966

c. Y = 0.82x + 0.11



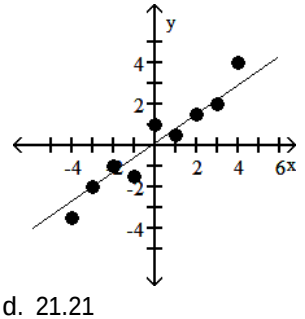
d. -21.43

D) a.



b. -0.966

c. Y = -0.82x - 0.11

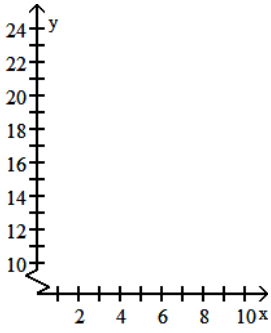


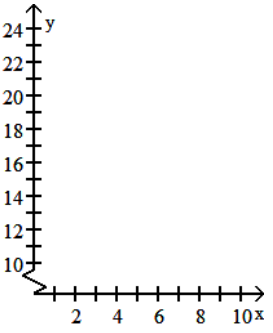
d. 21.21

126) For the following table of data, 126) ____

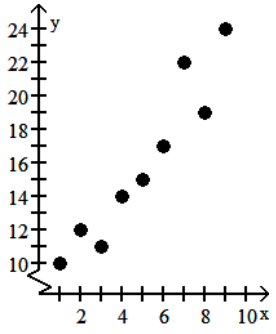
a. Draw a scatterplot.
b. Calculate the correlation coefficient.
c. Calculate the least squares line and graph it on the scatterplot.
d. Predict the y-value when x is 13.

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



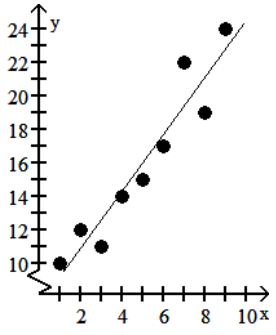


A) a.



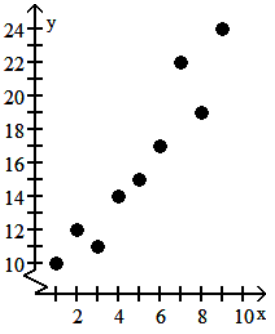
b. 0.950

c. Y = 1.7x + 7.5



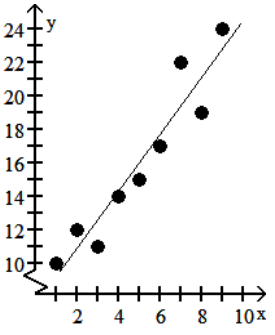
d. 29.6

B) a.



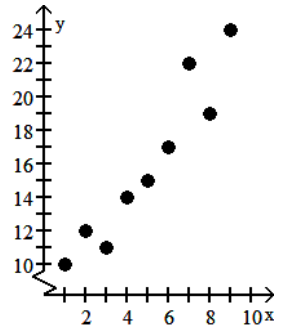
b. 0.950

c. Y = 1.7x + 8.5



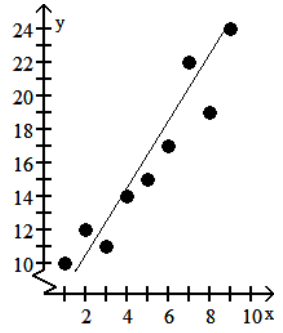
d. 30.6

C) a.



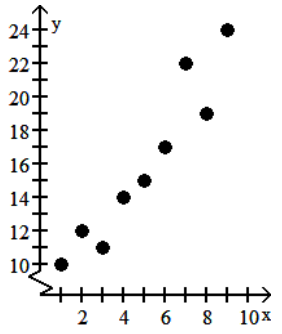
b. 0.903

c. Y = 2x + 6.5



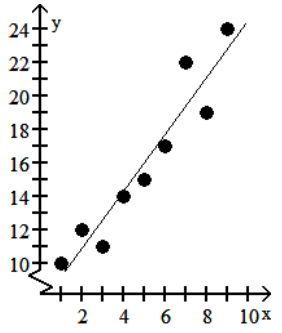
d. 32.5

D) a.



b. 0.950

c. Y = 1.7x



d. 22.1

Find the correlation coefficient.

127) Consider the data points with the following coordinates: 127) ____

x	48.9	37.5	17.4	17.4	21.0
y	8	10	2	8	6

A) -0.5,785 B) 0.5,149 C) 0.5,785 D) 0

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

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

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

129) The test scores of 6 randomly picked students and the number of hours they prepared are as follows: 129) ____

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

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

130) Consider the data points with the following coordinates: 130) ____

x	57	53	59	61	53	56	60
y	156	164	163	177	159	175	151

A) 0.2145 B) 0.1085 C) -0.0783 D) -0.0537

131) Consider the data points with the following coordinates: 131) ____

x	62	53	64	52	52	54	58
y	158	176	151	164	164	174	162

A) 0 B) -0.7749 C) -0.0810 D) 0.7537

132) Consider the data points with the following coordinates: 132) ____

x	121	101	128	160	154	126	134
y	171	152	168	157	164	169	160

A) 0.0537 B) -0.0781 C) 0.2245 D) 0.5370

133) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 133) ____

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

A) -0.0707 B) 0.7077 C) 0.2456 D) 0.2353

134) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 134) ____

Cost	6	3	7	6	10	4	7	7
Number	54	75	91	57	96	52	92	100

A) -0.3707 B) 0.6112 C) 0.6756 D) 0.2635

135) The following are the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters): 135) ____

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

A) 0 B) -0.2105 C) 0.1955 D) 0.2563

136) The following are the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters): 136) ____

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 C) -0.0953 D) 0.0396

Find the equation of the least squares line.

137) 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. 137) ____

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

138) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test. 138) ____

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

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

139) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). 139) ____

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

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

140) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). 140) ____

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

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

141) 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. 141) ____

Number of hours spent in lab (x)	Grade (percent)(y)
10	96
11	51
16	62
9	58
7	89
15	81
16	46
10	51

A) y = 0.930 + 44.3x
B) y = 44.3 + 0.930x
C) y = 1.86 + 88.6x
D) y = 88.6 - 1.86x

142) 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. 142) ____

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 = -0.930 + 19.4x
B) y = 19.4 + 0.930x
C) y = 0.930 - 19.4x
D) y = -19.4 - 0.930x

143) Managers rate employees according to job performance and attitude. The results for several randomly selected employees are given below. 143) ____

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 = -47.3 + 2.02x
B) y = 11.7 + 1.02x
C) y = 2.81 + 1.35x
D) y = 92.3 - 0.669x

144) 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. 144) ____

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 = 5.05 + 1.91x
B) y = 10.7 + 1.53x
C) y = 75.3 - 0.329x
D) y = 2.36 + 2.03x

145) 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. 145) ____

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

A) y = 5.18x + 20.6 B) y = 2.61x + 25.9
C) y = 3.31x + 23.8 D) y = 4.37x + 21.7

146) In the table below, x represents the number of years since 2000 and y represents the population (in thousands) of the town Boomville. 146) ____

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

A) y = 12x + 20 B) y = 28x - 10 C) y = 25x - 5 D) y = 18x + 8

Solve the problem.

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 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). 147) ____

A) 151.4 pounds B) 161.2 pounds C) 160.0 pounds D) 165.1 pounds

148) 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). 148) ____

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

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 the percentage of defective bulbs in June.

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

150) 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. 150) ____

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) February C) March D) May

151) 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 3.4. 151) ____

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) 3.58 B) 3.40 C) 3.78 D) 3.29

152) 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 equation of the least squares line to predict the score on the test of a student who studies 2 hours. 152) ____

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

A) 74.4 B) 69.4 C) 70.3 D) 64.4

153) 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 $5,000. 153) ____

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

A) 69.75 products sold B) 66.75 products sold

C) 14,005.8 products sold D) 76.45 products sold

154) 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 78. 154) ____

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

A) 31.06 mm B) 29.42 mm C) 32.31 mm D) 31.68 mm

155) 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. 155) ____

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

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

156) 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 16 hours in the lab. 156) ____

Number of hours spent in lab (x)	Grade (percent) (y)
10	96
11	51
16	62
9	58
7	89
15	81
16	46
10	51

A) 62.0% B) 72.6% C) 54.8% D) 58.8%

Provide an appropriate response.

157) Find k so that the line through (3, k) and (1, -2) is parallel to $3x - 3y = -2$. Find k so that the line is perpendicular to $3x + 2y = 4$. 157) ____

A) 4; $-\frac{10}{3}$ B) 0; $-\frac{2}{3}$ C) 4; $-\frac{2}{3}$ D) 0; $-\frac{10}{3}$

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

158) 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. 158) _____

159) 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. 159) _____

160) Give a definition or an example of the word or phrase: Perpendicular lines 160) _____

161) Why is the slope of a horizontal line equal to zero? Give an example. 161) _____

162) Explain what is wrong with the statement "The line has no slope." 162) _____

163) Why is the slope of a vertical line undefined? 163) _____

164) Can an equation of a vertical line be written in slope-intercept form? Explain. 164) _____

165) 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. 165) _____

166) Show that the points $P_1(2,4)$, $P_2(5,2)$, and $P_3(7,5)$ are the vertices of a right triangle. 166) _____

Answer Key
Testname: UNTITLED4

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

43) C
44) A
45) B
46) A
47) B
48) B
49) C
50) D
51) B
52) A
53) D
54) B
55) B
56) D
57) B
58) B
59) A
60) C
61) B
62) A
63) C
64) A
65) A
66) D
67) B
68) D
69) D
70) C
71) A
72) A
73) A
74) C
75) D
76) C
77) C
78) B
79) B
80) A
81) C
82) D
83) A
84) C

85) C
86) B
87) B
88) C
89) B
90) D
91) D
92) A
93) C
94) C
95) C
96) B
97) D
98) A
99) D
100) B
101) B
102) D
103) B
104) B
105) B
106) D
107) A
108) B
109) C
110) A
111) A
112) C
113) C
114) C
115) A
116) A
117) D
118) A
119) D
120) D
121) B
122) A
123) C
124) B
125) B
126) A

127) C
128) D
129) A
130) B
131) B
132) A
133) B
134) B
135) C
136) C
137) D
138) C
139) B
140) C
141) D
142) B
143) B
144) A
145) C
146) C
147) B
148) C
149) C
150) A
151) C
152) B
153) A
154) A
155) B
156) D
157) B
158) The slope of 800 indicates that during his 12 years at the school, John's salary has increased by approximately $800 per year.
159) 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.
160) Two lines which intersect at right angles. (Answers may vary.)

161) 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) are two points on a horizontal line. The slope of this line is zero because $m = \frac{4 - 4}{7 - 3} = \frac{0}{4} = 0$.

162) 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.

163) 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.

164) 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.)

165) 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 $33,333.\overline{3}$.(Explanations will vary.)

166) 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.