Exam

Name_____

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

Provide an appropriate response.

1) Give a definition or an example of the word or phrase: Zero slope 1) _____

Answer: An equation such as by + c = 0 has a slope of zero. (Answers may vary.)

Explanation:

2) Why is the slope of a horizontal line equal to zero? Give an example. 2) _____

Answer: 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 $m = \frac{4 - 4}{7 - 3} = \frac{0}{4} = 0$.

Explanation:

3) Can an equation of a vertical line be written in slope-intercept form? Explain. 3) _____

Answer: 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.)

Explanation:

4) Explain what is wrong with the statement "The line has no slope." 4) _____

Answer: 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.

Explanation:

5) Why is the slope of a vertical line undefined? 5) _____

Answer: 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.

Explanation:

6) 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. 6) _____

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

For example, a company decided to make oak filing cabinets. Fixed costs would ir 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.

Explanation:

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

Answer: 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.

Explanation:

8) 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. 8) _____

Answer: 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.)

Explanation:

9) 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. 9) _____

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

Explanation:

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

Solve the problem.

10) Given the supply and demand functions below, find the demand when p = $12. 10) _____

S(p) = 5p

D(p) = 120 - 4p

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

Answer: A

Explanation: A)

B)

C)

D)

11) 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 7 hours in the lab. 11) _____

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) 81.6% B) 77.0% C) 71.6% D) 75.6%

Answer: D

Explanation: A)

B)

C)

D)

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

12) y-intercept -5, x-intercept 10 12) _____

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

Answer: A

Explanation: A)

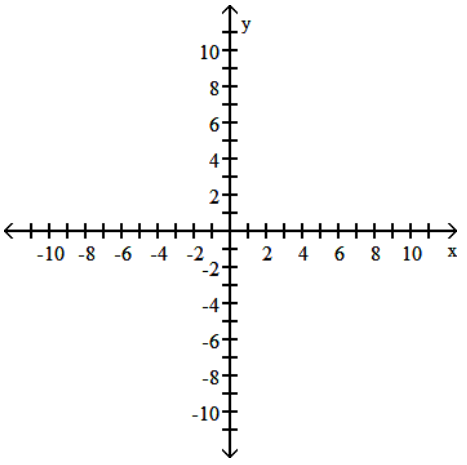
B)

C)

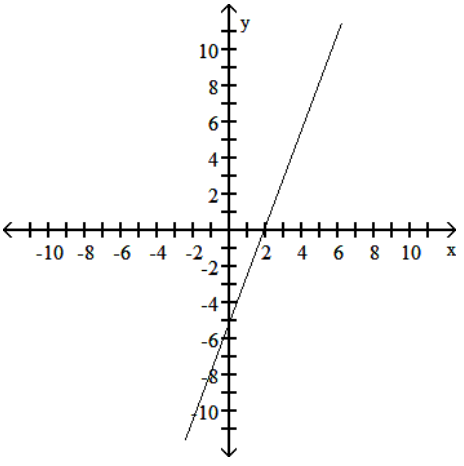
D)

Graph the equation.

13) $3y + 8x = 15$ 13) _____



A)



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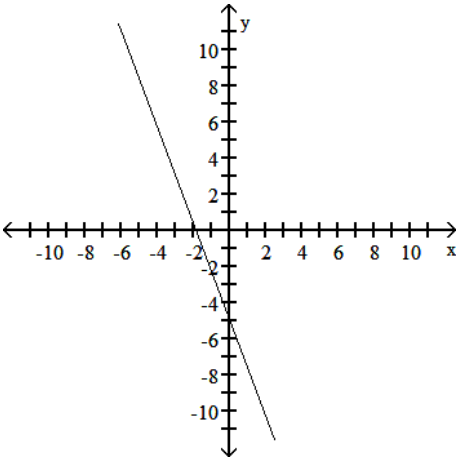

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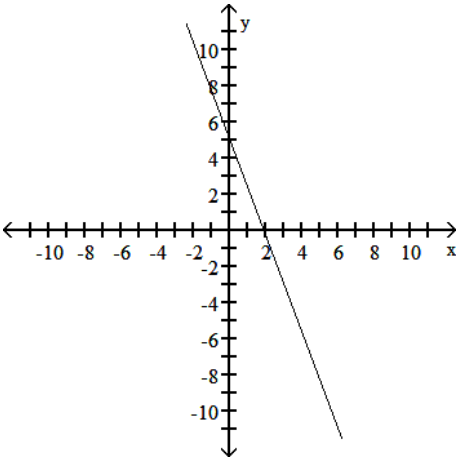

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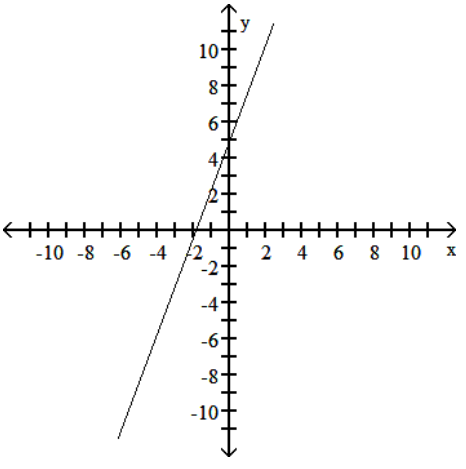


Answer: C

Explanation: A)

B)

C)

D)

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

14) Marginal cost, \$50; 50 items cost \$2900 to produce 14) _____

A) C(x) = 8x + 400 B) C(x) = 50x + 400

C) C(x) = 8x + 2900 D) C(x) = 50x + 2900

Answer: B

Explanation: A)

B)

C)

D)

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

15) Through (3, 2), $m = -\frac{5}{9}$ 15) _____

A) $y = -\frac{5}{9}x + \frac{5}{3}$ B) $y = -\frac{5}{9}x + \frac{11}{3}$ C) $y = \frac{5}{9}x + \frac{5}{3}$ D) $y = \frac{5}{9}x - \frac{11}{3}$

Answer: B

Explanation: A)

B)

C)

D)

Find the correlation coefficient.

16) Consider the data points with the following coordinates: 16) _____

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

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

Answer: B

Explanation: A)

B)

C)

D)

Solve the problem.

17) Suppose the function y = 1.8t - 3.3 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. 17) _____

A) 104.7 min B) 54.06 min C) 111.3 min D) 65.94 min

Answer: A

Explanation: A)

B)

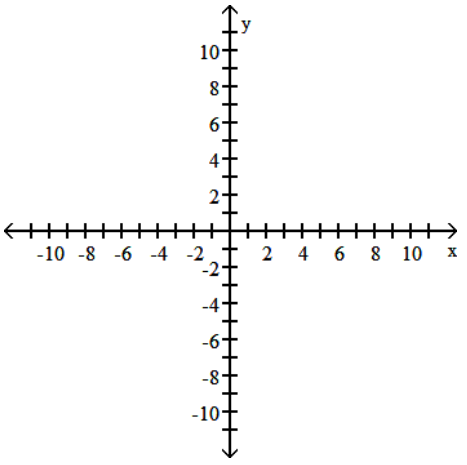
C)

D)

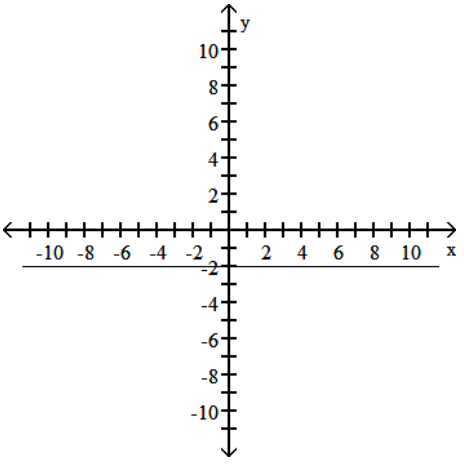
Graph the equation.

18) x - 2 = 0

18) _____



A)



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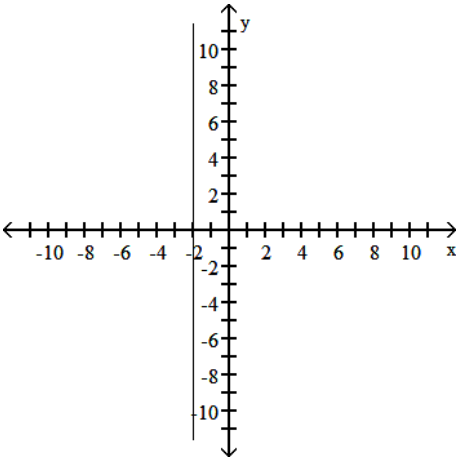

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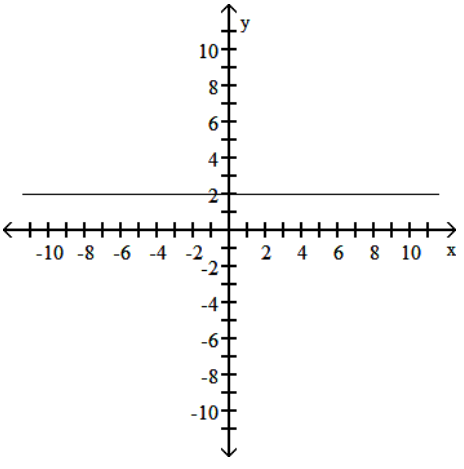

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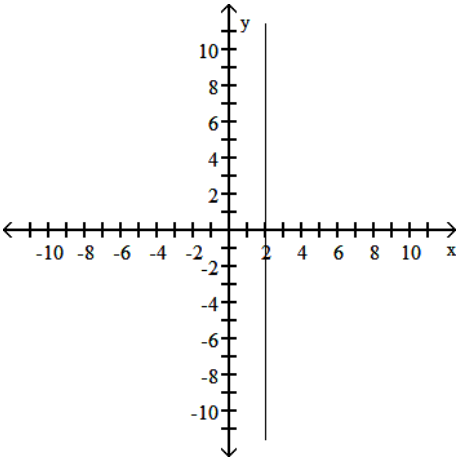


Answer: D

Explanation: A)

B)

C)

D)

Solve the problem.

19) 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 13 degrees? (Round to the nearest foot.) 19) _____

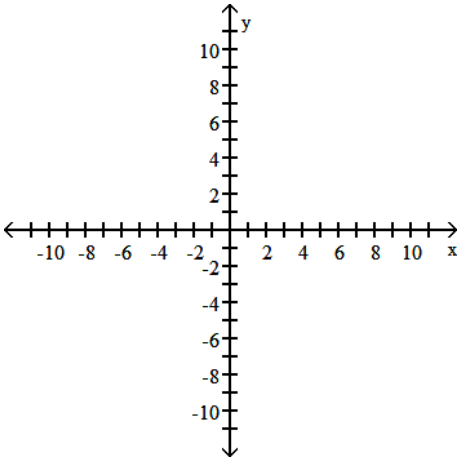
A) 53 feet B) 23 feet C) 60 feet D) 4 feet

Answer: D

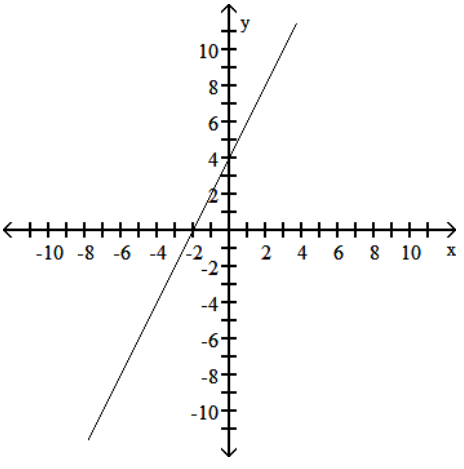
Explanation: A)
B)
C)
D)

Graph the equation.

20) y = -2x - 4 20) _____



A)



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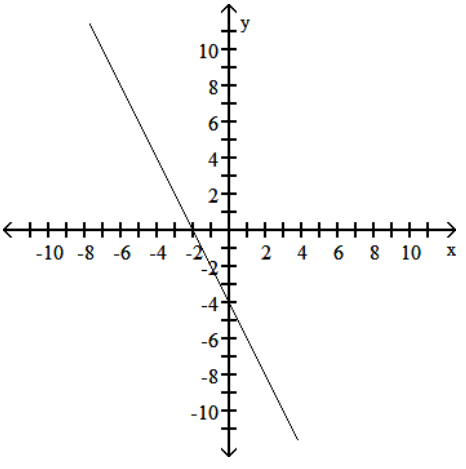

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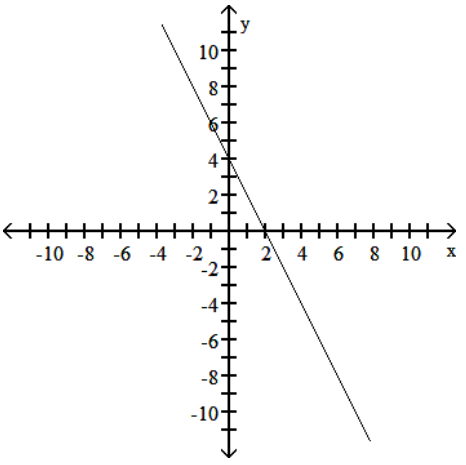
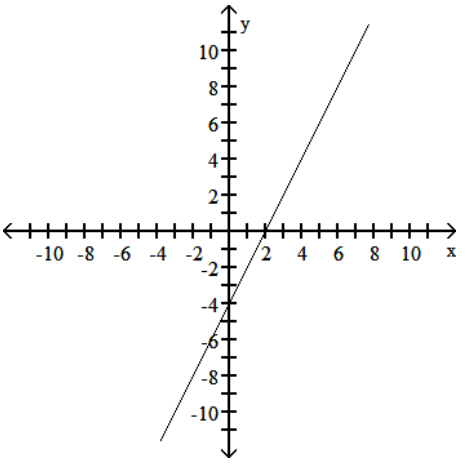


D)



Answer: B

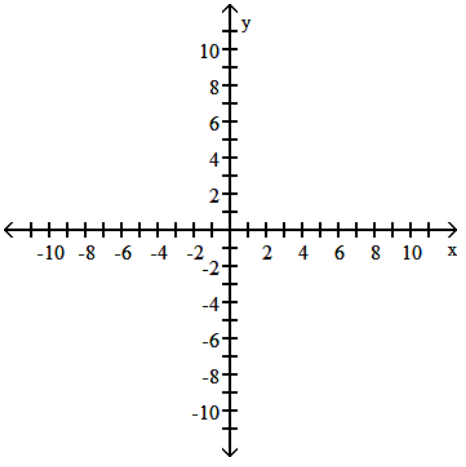
Explanation: A)

B)

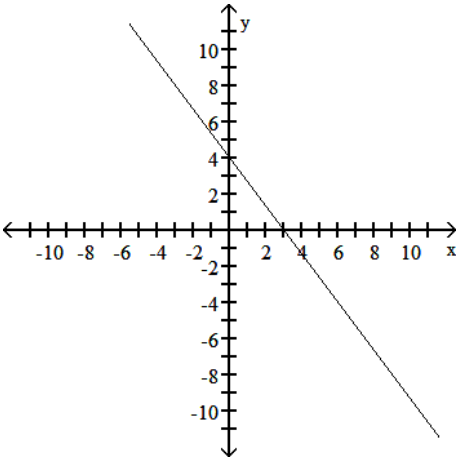
C)

D)

21) $4x + 3y = 12$ 21) _____



A)



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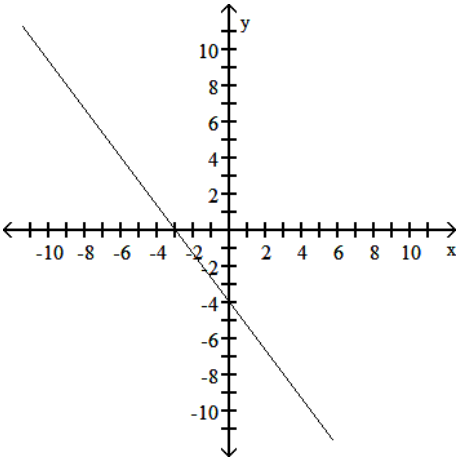

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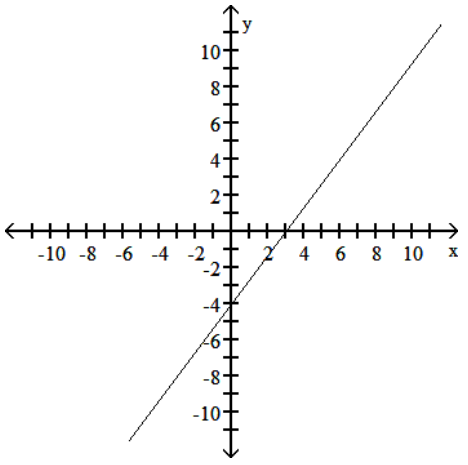
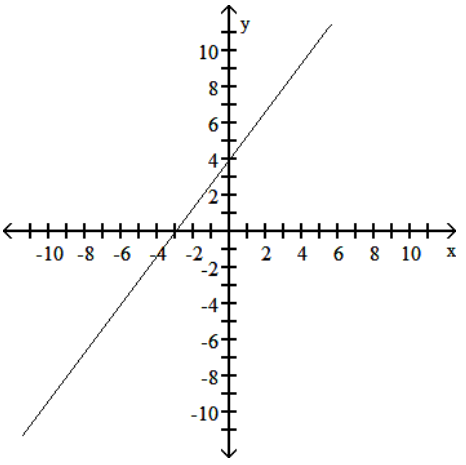


D)



Answer: A

Explanation: A)

B)

C)

D)

Solve the problem.

22) Regrind, Inc. regrinds used typewriter platens. The cost per platen is $1.30. The fixed cost to run the grinding machine is $252 per day. If the company sells the reground platens for $5.30, how many must be reground daily to break even? 22) _____

A) 42 platens B) 193 platens C) 63 platens D) 38 platens

Answer: C

Explanation: A)

B)

C)

D)

Find the correlation coefficient.

23) Consider the data points with the following coordinates: 23) _____

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

Answer: B

Explanation: A)

B)

C)

D)

Solve the problem.

24) 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). 24) _____

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

Answer: D

Explanation: A)
B)
C)
D)

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

25) Through (-2, 1) and (10, 1) 25) _____

A) $x = -2$ B) $\frac{1}{5}x + 10y = 0$ C) $5x - 2y = 0$ D) $y = 1$

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

26) 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 $69 per toilet. The company expects to sell the toilets for $156. Formulate a function P(x) for the total profit from the production and sale of x toilets. 26) _____

A) $P(x) = 156x - 16600$ B) $P(x) = 87x - 16600$

C) $P(x) = 87x$ D) $P(x) = 87x + 16600$

Answer: B

Explanation: A)
B)
C)
D)

27) 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 $5430 and the cost to produce 15,000 bags as $7920. Find the marginal cost of the bags of microwave popcorn to be produced in this plant. 27) _____

A) $2490.00 B) $49.80 C) $4.98 D) $0.50

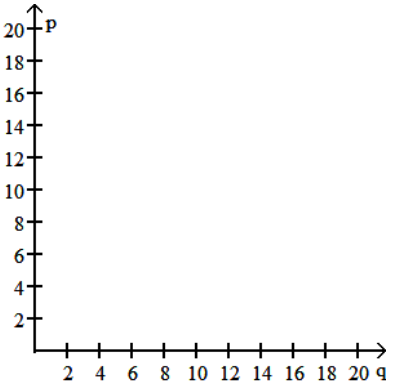
Answer: D

Explanation: A)
B)
C)
D)

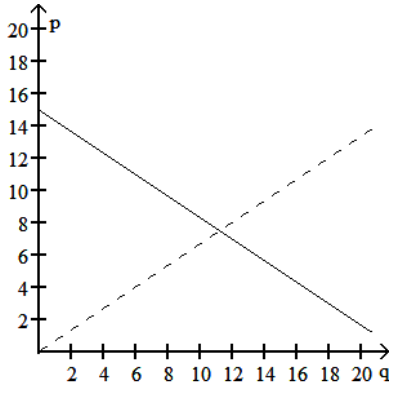
28) Let the supply and demand functions for a certain model of electric pencil sharpener be given by 28) _____

$p = S(q) = \frac{2}{3}q$ and $p = D(q) = 15 - \frac{2}{3}q$,

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 line). Also, find the equilibrium quantity and the equilibrium price.

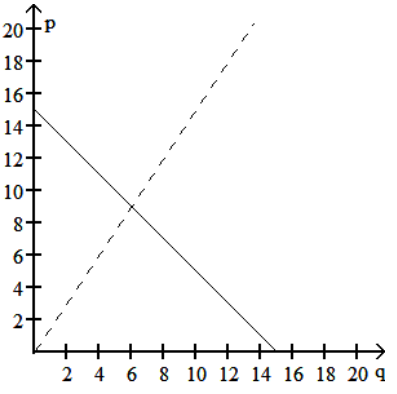


A)



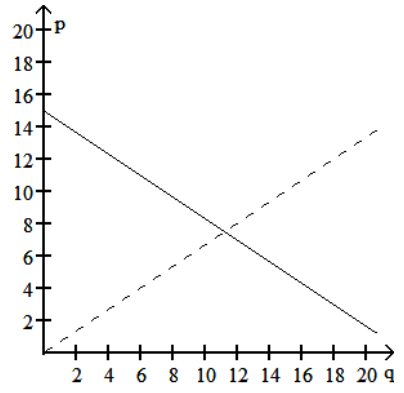
Equilibrium quantity: 950
Equilibrium price: $7

B)



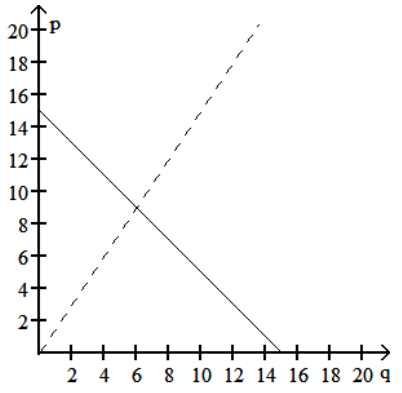
Equilibrium quantity: 900
Equilibrium price: $6.00

C)



Equilibrium quantity: 1125
Equilibrium price: $7.5

D)



Equilibrium quantity: 600
Equilibrium price: $9.00

Answer: C

Explanation: A)
B)
C)
D)

29) Let the demand and supply functions be represented by D(p) and S(p), where p is the price in dolla 29) _____
Find the equilibrium price and equilibrium quantity for the given functions.
D(p) = 4800 - 40p
S(p) = 160p

A) $120; 3840 B) $30; 3600 C) $120; 0 D) $24; 3840

Answer: D

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

30) 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. 30) _____

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

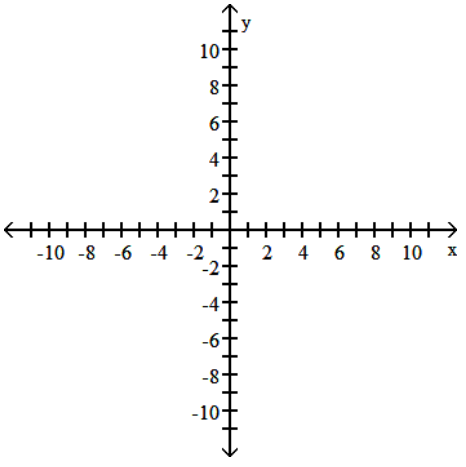
A) y = 1.86 + 88.6x
B) y = 44.3 + 0.930x
C) y = 88.6 - 1.86x
D) y = 0.930 + 44.3x

Answer: C

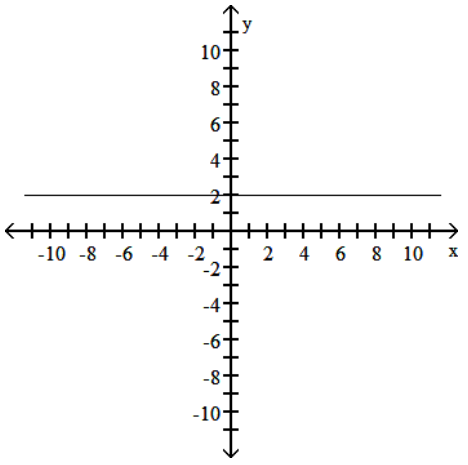
Explanation: A)
B)
C)
D)

Graph the equation.

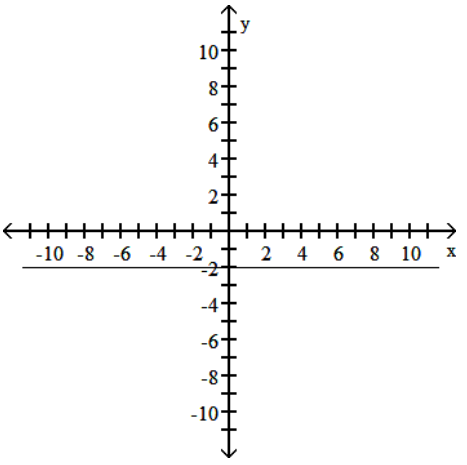
31) x = -2 31) _____



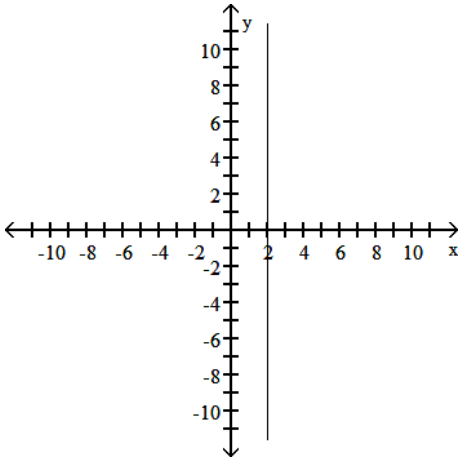
A)



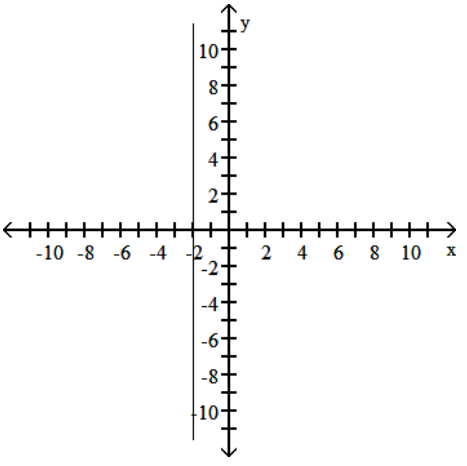
B)



C)



D)



Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

32) 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. 32) _____

A) y = 4.25x + 90 where x is the number of years since 1990
B) y = 3x + 105 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

Answer: B

Explanation: A)
B)
C)
D)

Find the slope of the line.

33) The x-axis 33) _____

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

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

34) On a summer day, the surface water of a lake is at a temperature of 20° Celsius. What is this temperature in Fahrenheit? 34) _____

A) 20° B) 52° C) 68° D) 36°

Answer: C

Explanation: A)
B)
C)
D)

Find the slope of the line.

35) A line perpendicular to $6x = 9y - 5$ 35) _____

A) $-\frac{3}{2}$ B) $-\frac{5}{9}$ C) $-\frac{2}{3}$ D) $\frac{3}{2}$

Answer: A

Explanation: A)
B)
C)
D)

36) $y = 2x - 8$ 36) _____

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

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

37) Northwest Molded molds plastic handles which cost $1.00 per handle to mold. The fixed cost to run the molding machine is $4244 per week. If the company sells the handles for $3.00 each, how many handles must be molded weekly to break even? 37) _____

A) 2122 handles B) 4244 handles C) 1414 handles D) 1061 handles

Answer: A

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

38) The paired data below consist of the costs of advertising (in thousands of dollars) and the number o products sold (in thousands). 38) _____

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

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

39) 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? 39) _____

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

Answer: C

Explanation: A)
B)
C)
D)

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

40) Through (0, 3), $m = \frac{1}{2}$ 40) _____

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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

41) For some reason the quality of production decreases as the year progresses at a light bulb manufact 41) _____
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.

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) 2.15% C) 2.20% D) 2.3%

Answer: B

Explanation: A)
B)
C)
D)

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

42) Through (-3, -8) and (-1, -17) 42) _____

A) $y = -\frac{9}{2}x - \frac{43}{2}$ B) $y = -\frac{2}{9}x - \frac{26}{3}$ C) $y = -\frac{9}{2}x - \frac{22}{3}$ D) $y = \frac{9}{2}x + \frac{11}{2}$

Answer: A

Explanation: A)
B)
C)
D)

43) Through (-1, -7), perpendicular to x = 5 43) _____

A) y = 5 B) y = -7 C) x = 5 D) y = 7

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

44) The mathematical model C = 600x + 60,000 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 500 items? 44) _____

A) $100.00 B) $0.20 C) $360,000 D) $300,000

Answer: C

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

45) Find f(-17) when f(x) = 13x - 9. 45) _____

A) -221.9 B) -230 C) -212 D) 212

Answer: B

Explanation: A)
B)
C)
D)

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

46) Through (6, 4), perpendicular to -7x - 4y = -58 46) _____

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

Answer: A

Explanation: A)
B)
C)
D)

47) Through (-3, 4), m = 2.5 47) _____

A) y = -2.5x + 11.5 B) y = 2.5x + 11.5
C) y = -2.5x - 3.5 D) y = 2.5x - 3.5

Answer: B

Explanation: A)
B)
C)
D)

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

48) 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. 48) _____

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

Answer: C

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

49) Find f(0) when f(x) = -3x + 19. 49) _____

A) 19 B) 16 C) 0 D) -3

Answer: A

Explanation: A)
B)
C)
D)

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

50) Through (2, 5), m = 0 50) _____

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

Answer: C

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

51) The following are the temperatures on randomly chosen days and the amount a certain kind of pla grew (in millimeters): 51) _____

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

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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

52) 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 72. 52) _____

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

A) 30.37 mm B) 30.94 mm C) 29.79 mm D) 28.28 mm

Answer: C

Explanation: A)
B)
C)
D)

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

53) Through (-2, 0) and (-8, 5) 53) _____

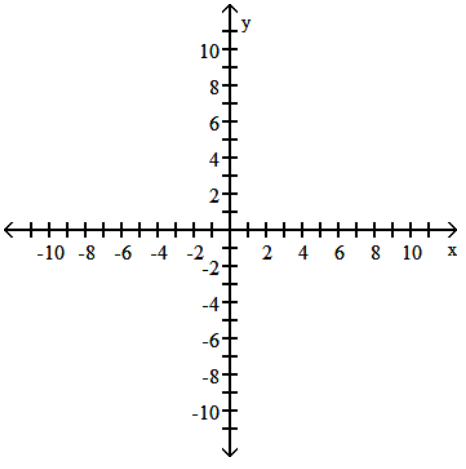
A) $y = -\frac{5}{6}x - \frac{5}{3}$ B) $y = \frac{2}{13}x + \frac{81}{13}$ C) $y = \frac{5}{6}x - \frac{5}{3}$ D) $y = -\frac{2}{13}x + \frac{81}{13}$

Answer: A

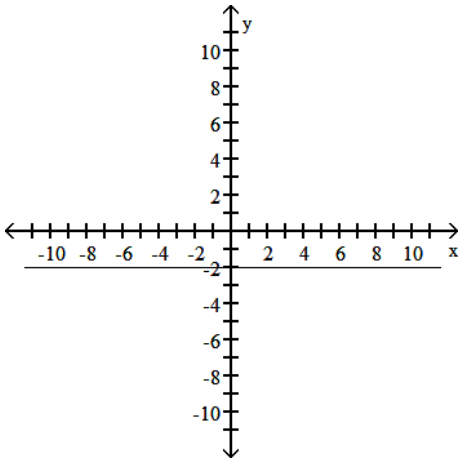
Explanation: A)
B)
C)
D)

Graph the equation.

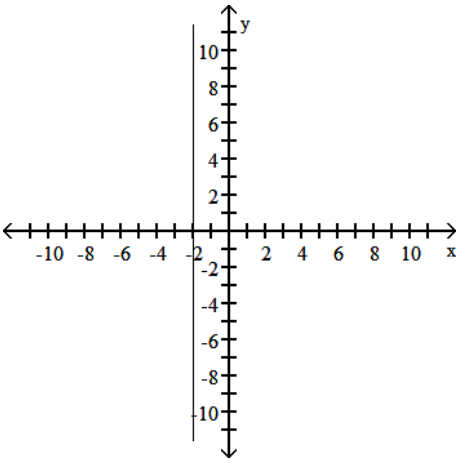
54) y = 2 54) _____



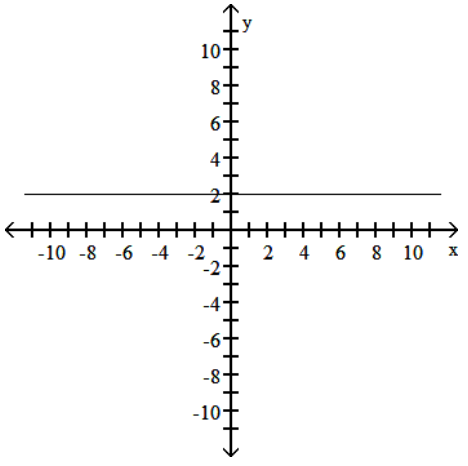
A)



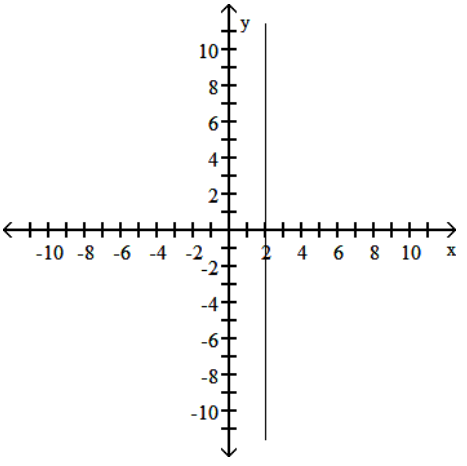
B)



C)



D)



Answer: C

Explanation: A)

B)

C)

D)

Find the equation of the least squares line.

55) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) w they entered the program were between 3.5 and 4.0. The following data were obtained regarding th GPAs on entering the program versus their current GPAs. 55) _____

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 = 2.51 + 0.329x
C) y = 4.91 + 0.0212x
D) y = 3.67 + 0.0313x

Answer: D

Explanation: A)
B)
C)
D)

56) Two separate tests are designed to measure a student's ability to solve problems. Several students a randomly selected to take both tests and the results are shown below. 56) _____

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

Answer: D

Explanation: A)
B)
C)
D)

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

57) Through (-4, 4), m = -3 57) _____

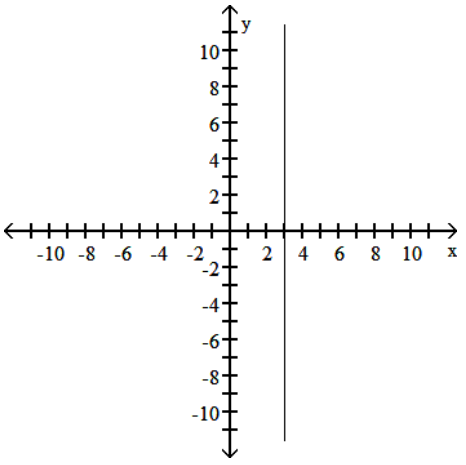
A) y = 3x + 16
B) y = 3x - 8
C) y = -3x + 16
D) y = -3x - 8

Answer: D

Explanation: A)
B)
C)
D)

Find the slope of the line.

58) 58) _____



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

Answer: B

Explanation: A)
B)
C)
D)

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

59) Through (-1, 1) and (8, 5) 59) _____

A) $y = \frac{2}{3}x + \frac{31}{3}$ B) $y = -\frac{2}{3}x + \frac{31}{3}$ C) $y = \frac{4}{9}x + \frac{13}{9}$ D) $y = -\frac{4}{9}x + \frac{13}{9}$

Answer: C

Explanation: A)
B)
C)
D)

Find the slope of the line.

60) $3x - 5y = -40$ 60) _____

A) $-\frac{5}{3}$ B) 8 C) $\frac{3}{5}$ D) $-\frac{3}{5}$

Answer: C

Explanation: A)
B)
C)
D)

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

61) A cable TV company charges $28 for the basic service plus $8 for each movie channel. Let C(x) be the total cost in dollars of subscribing to cable TV, using x movie channels. 61) _____

A) C(x) = 8x - 28 B) C(x) = 8x + 28 C) C(x) = 28x + 8 D) C(x) = 28x - 8

Answer: B

Explanation: A)
B)
C)
D)

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

62) Through (-13, -1), m = 2 62) _____

A) y = -2x - 25 B) y = 2x + 25 C) y = 2x - 1 D) y = -2x - 11

Answer: B

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

63) Find f(3.2) when f(x) = 1.0x - 9. 63) _____

A) -12.2 B) -5.8 C) 2.3 D) 12.2

Answer: B

Explanation: A)
B)
C)
D)

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

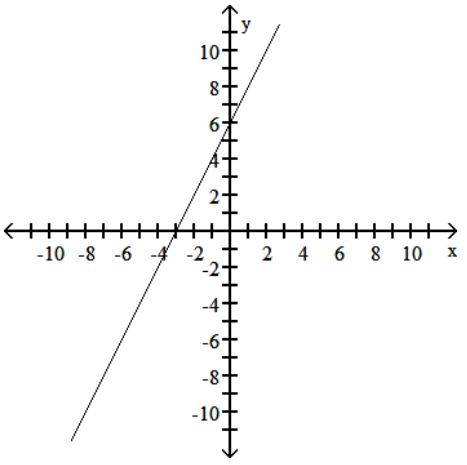
64) A moving firm charges a flat fee of $45 plus $40 per hour. Let C(x) be the cost in dollars of using the moving firm for x hours. 64) _____

A) C(x) = 45x - 40 B) C(x) = 40x + 45 C) C(x) = 40x - 45 D) C(x) = 45x + 40

Answer: B

Explanation: A)
B)
C)
D)

Find the slope of the line.

65) 

65) _____

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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

66) Assume that the sales of a certain appliance dealer can be approximated by a straight line. Suppose that sales were $11,500 in 1982 and $87,500 in 1987. Let x = 0 represent 1982. Find the equation giving yearly sales S.

66) _____

A) S = 76,000x + 87,500 B) S = 15,200x + 11,500
C) S = 76,000x + 11,500 D) S = 15,200x + 87,500

Answer: B

Explanation: A)
B)
C)
D)

67) 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 $100 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?

67) _____

A) 241 pairs B) 69 pairs C) 348 pairs D) 775 pairs

Answer: C

Explanation: A)
B)
C)
D)

68) Midtown Delivery Service delivers packages which cost $2.30 per package to deliver. The fixed cost to run the delivery truck is $352 per day. If the company charges $6.30 per package, how many packages must be delivered daily to make a profit of $64? 68) _____

A) 153 packages B) 104 packages C) 88 packages D) 40 packages

Answer: B

Explanation: A)
B)
C)
D)

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

69) An electrician charges a fee of $50 plus $35 per hour. Let C(x) be the cost in dollars of using the electrician for x hours. 69) _____

A) C(x) = 35x + 50 B) C(x) = 35x - 50 C) C(x) = 50x - 35 D) C(x) = 50x + 35

Answer: A

Explanation: A)
B)
C)
D)

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

70) Through (-6, 4.5) and (-4, 8.5) 70) _____

A) y = 0.5x + 7.5 B) y = -0.5x + 1.5 C) y = -2x - 7.5 D) y = 2x + 16.5

Answer: D

Explanation: A)
B)
C)
D)

Provide an appropriate response.

71) Find k so that the line through (3, k) and (1, -2) is parallel to 4x - 2y = 5. Find k so that the line is perpendicular to 2x + 3y = 6. 71) _____

A) 2; - 5 B) 6; 1 C) 2; 1 D) 6; - 5

Answer: C

Explanation: A)
B)
C)
D)

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

72) Through (-1, -12), parallel to $-5x - 4y = 41$ 72) _____

A) $y = \frac{5}{4}x + \frac{53}{4}$ B) $y = -\frac{5}{4}x - \frac{53}{4}$ C) $y = -\frac{1}{4}x - \frac{41}{4}$ D) $y = -\frac{4}{5}x + \frac{12}{5}$

Answer: B

Explanation: A)
B)
C)
D)

73) The line with x-intercept 5 and perpendicular to $7x - y = 9$ 73) _____

A) $y = -\frac{1}{7}x + \frac{5}{7}$ B) $y = -\frac{1}{7}x + 5$ C) $y = -7x + 35$ D) $y = \frac{1}{7}x + \frac{5}{7}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

74) 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 estimat sales in the year 2006. Round to the nearest thousand dollars. 74) _____

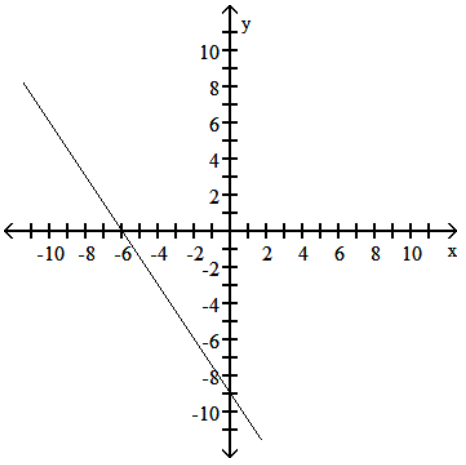
Year (x)	1	2	3	4	5
Sales (y)	30	40	60	90	130

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

Answer: A

Explanation: A)
B)
C)
D)

Find the slope of the line.

75) 

75) _____

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

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

76) Suppose that the demand and price for a certain model of graphing calculator are related by $p = D(q) = 100 - 4.25q$, where p is the price (in dollars) and q is the demand (in hundreds). Find the demand for the calculator if the price is $32. Round to the nearest whole number if necessary.

76) _____

A) 1600 calculators B) 400 calculators
C) 27,200 calculators D) 16 calculators

Answer: A

Explanation: A)
B)
C)
D)

77) 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 19.5 thousand dollars.

77) _____

A) 20.914 thousand dollars B) 13.943 thousand dollars
C) 23.329 thousand dollars D) 16.763 thousand dollars

Answer: D

Explanation: A)
B)
C)
D)

78) Given the supply and demand functions below, find the price when the demand is 145. 78) _____

S(p) = 9p + 12
D(p) = 280 - 9p

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

Answer: C

Explanation: A)
B)
C)
D)

79) 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 3.2. 79) _____

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) 3.77 B) 3.39 C) 3.57 D) 3.28

Answer: A

Explanation: A)
B)
C)
D)

80) 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 = 4.5 seconds. 80) _____

A) 155.3 feet per second B) 152 feet per second
C) 154 feet per second D) 153.3 feet per second

Answer: C

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

81) Find f(-2.3) when f(x) = 12. 81) _____

A) -12 B) -27.6 C) -2.3 D) 12

Answer: D

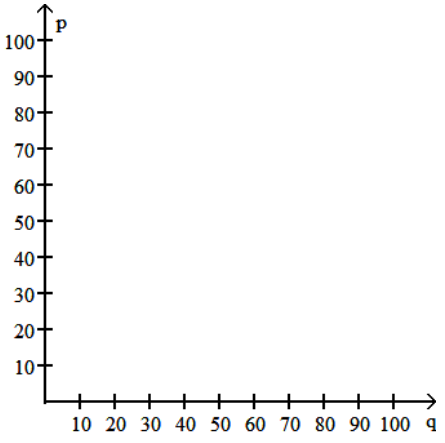
Explanation: A)
B)
C)
D)

Solve the problem.

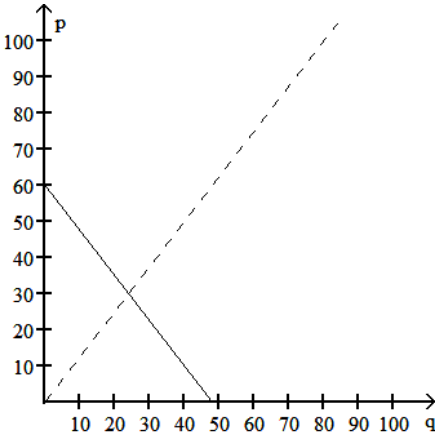
82) Let the supply and demand functions for raspberry-flavored licorice be given by 82) _____

$p = S(q) = \frac{5}{4}q$ and $p = D(q) = 60 - \frac{5}{4}q$,

where p is the price in dollars and q is the number of batches. Graph these functions on the same a
(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.

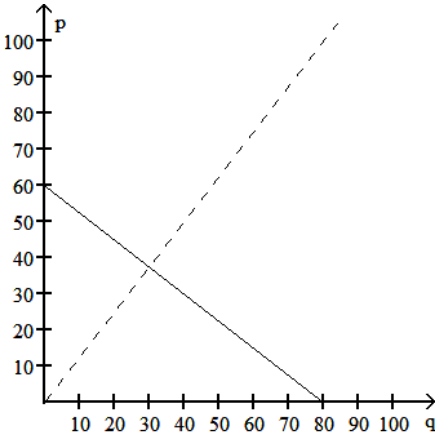


A)



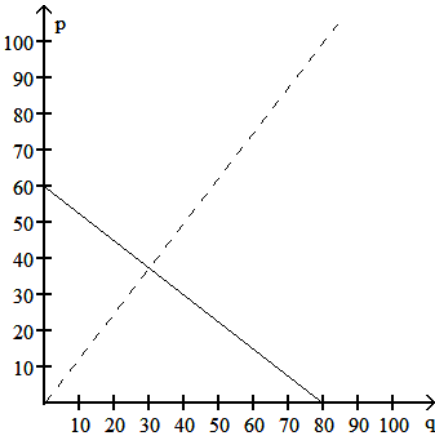
Equilibrium quantity: 24
Equilibrium price: $30.00

B)



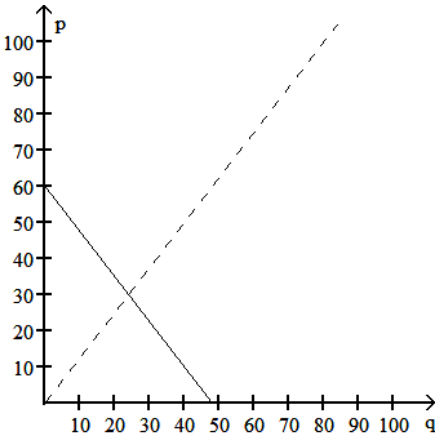
Equilibrium quantity: 30
Equilibrium price: $37.50

C)



Equilibrium quantity: 37.50
Equilibrium price: $30

D)



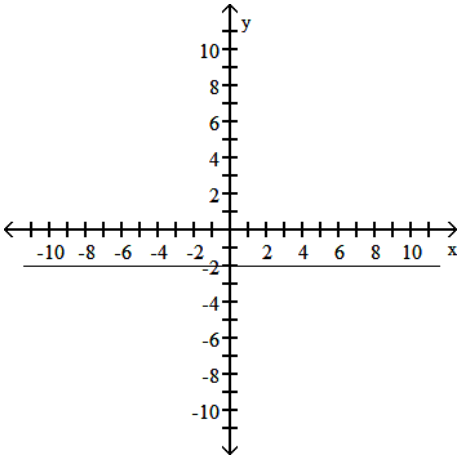
Equilibrium quantity: 30.00
Equilibrium price: $24

Answer: A

Explanation: A)
B)
C)
D)

Find the slope of the line.

83) 83) _____



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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

84) A book publisher found that the cost to produce 1000 calculus textbooks is $25,100, while the cost to produce 2000 calculus textbooks is $50,700. 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? 84) _____

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

Answer: A

Explanation: A)
B)
C)
D)

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

85) The line with y-intercept -2 and perpendicular to $x + 3y = -4$ 85) _____

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

Answer: D

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

86) Find $g(m^2)$ when $g(x) = -8 - 4x$. 86) _____

A) $-8 - 4x^2$ B) $-8 + -4m^2$ C) $-8 + m^2$ D) $-8 + 4m^2$

Answer: B

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

87) The test scores of 6 randomly picked students and the number of hours they prepared are as follow 87) _____

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

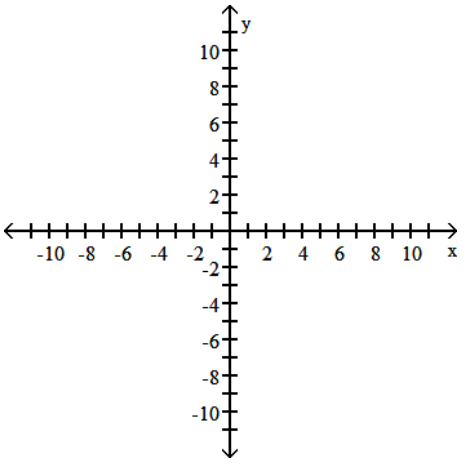
A) -0.6781 B) 0.6781 C) -0.2242 D) 0.2242

Answer: D

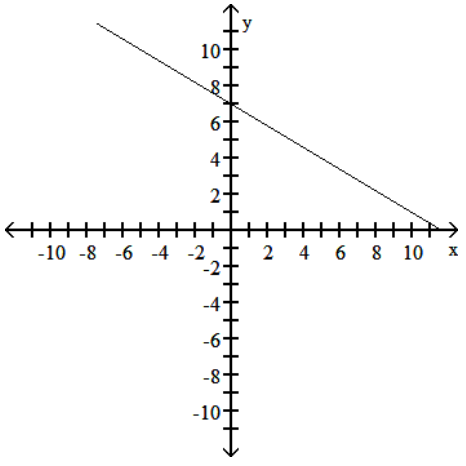
Explanation: A)
B)
C)
D)

Graph the equation.

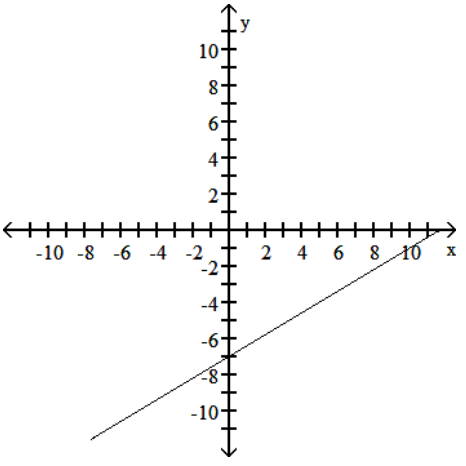
88) $5y - 3x = 35$ 88) _____



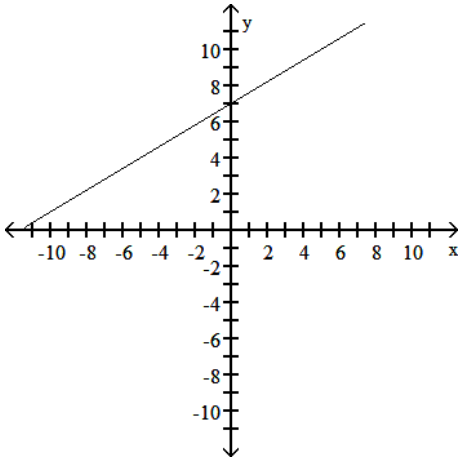
A)



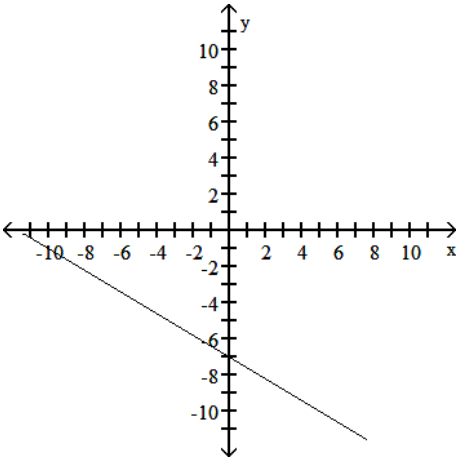
B)



C)



D)



Answer: C

Explanation: A)

B)

C)

D)

Solve the problem.

89) 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). 89) _____

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

Answer: D

Explanation: A)
B)
C)
D)

90) 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 $38 per pair of shoes. The shoes will sell for $106 for each pair. What is the profit if 600 pairs are sold? 90) _____

A) $64,800 B) $40,800 C) $16,800 D) $62,400

Answer: C

Explanation: A)
B)
C)
D)

91) 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 $11,000. 91) _____

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

A) 30,745.8 products sold B) 86.49 products sold
C) 93.19 products sold D) 83.49 products sold

Answer: B

Explanation: A)
B)
C)
D)

Find the slope of the line.

92) A line perpendicular to $8x - 3y = -11$ 92) _____

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

Answer: D

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

93) The following are the temperatures on randomly chosen days and the amount a certain kind of pla 93) _____
grew (in millimeters):

Temp	77	88	85	61	64	72	73	63	74
Growth	39	17	12	22	15	29	14	25	43

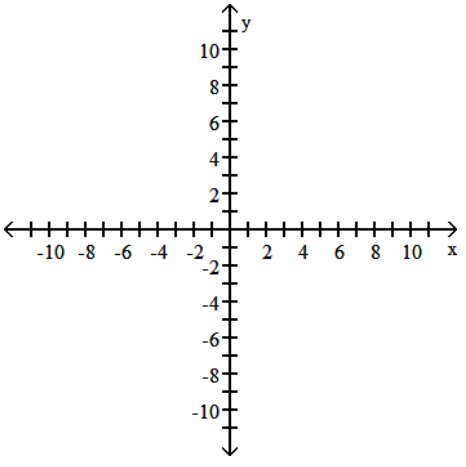
A) -0.3105 B) 0.0396 C) -0.0953 D) 0

Answer: C

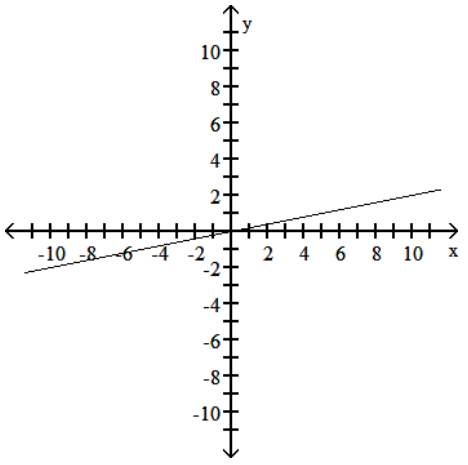
Explanation: A)
B)
C)
D)

Graph the equation.

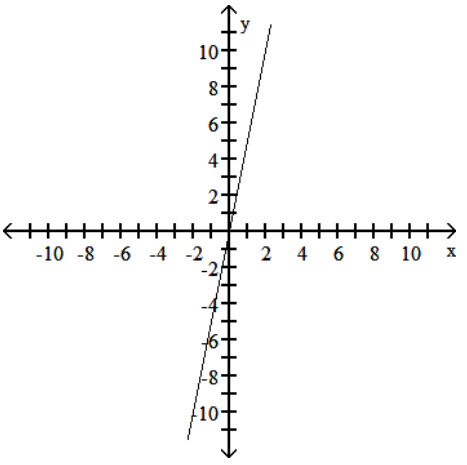
94) $y - 5 = 0$ 94) _____



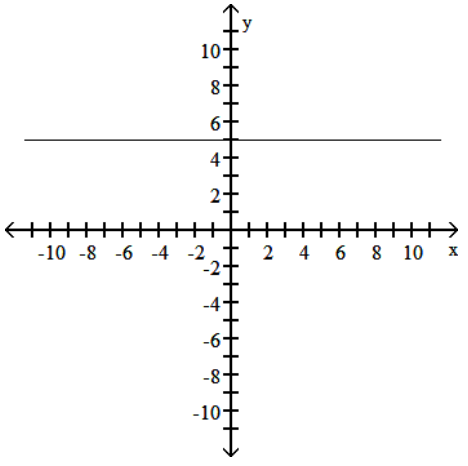
A)



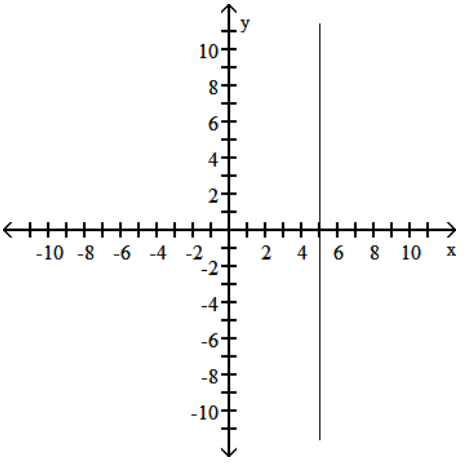
B)



C)



D)



Answer: C

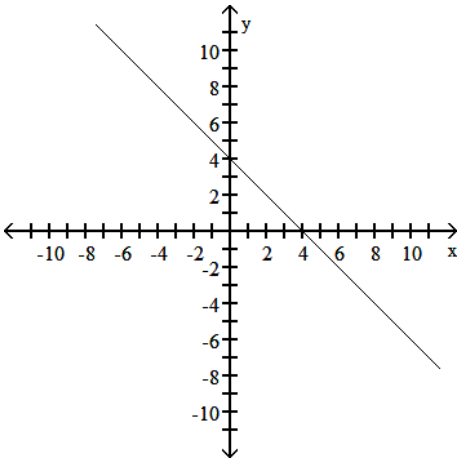
Explanation: A)

B)

C)

D)

Find the slope of the line.

95) 

95) _____

A) -1 B) 4 C) -4 D) 1

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

96) A biologist recorded 12 snakes on 41 acres in one area and 18 snakes on 45 acres in another area. Let y be the number of snakes in x acres. Write a linear equation for the number of snakes.

96) _____

A) $y = -\frac{3}{2}x + \frac{99}{2}$ B) $y = \frac{2}{3}x + \frac{99}{2}$ C) $y = \frac{3}{2}x - \frac{99}{2}$ D) $y = \frac{3}{2}x + \frac{99}{2}$

Answer: C

Explanation: A)
B)
C)
D)

97) Suppose that the price and supply for a certain model of graphing calculator are related by p = S(q) = 2q, where p is the price (in dollars) and q is the supply (in hundreds) of calculators. Find the supply if the price is $105. Round to the nearest whole number if necessary.

97) _____

A) 525 calculators B) 2625 calculators
C) 5250 calculators D) 1313 calculators

Answer: C

Explanation: A)
B)
C)
D)

Find the slope of the line.

98) A line parallel to $4y + 3x = 7$ 98) _____

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

Answer: D

Explanation: A)
B)
C)
D)

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

99) Through $(0, -1)$, $m = \frac{3}{4}$ 99) _____

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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

100) 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 $67 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. 100) _____

A) $C(x) = 16600 + 159x$; $R(x) = 67x$ B) $C(x) = 16600 + 67x$; $R(x) = 159x$

C) $C(x) = 16{,}667$; $R(x) = 159$ D) $C(x) = 67x$; $R(x) = 159x$

Answer: B

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

101) Find $f(-4)$ when $f(x) = -3x + 6$. 101) _____

A) 6 B) 18 C) -12 D) 3

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

102) The cost of owning a home includes both fixed costs and variable utility costs. Assume that it costs $5619 per month for mortgage and insurance payments and it costs an average of $2.96 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. 102) ____

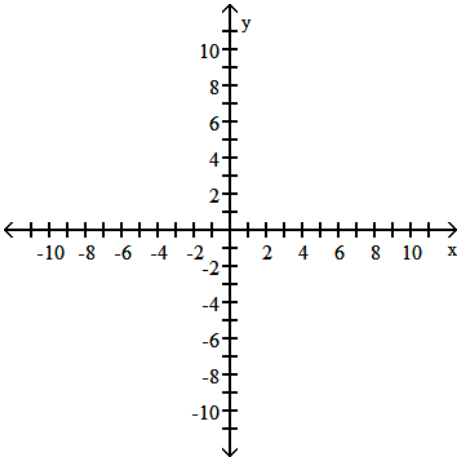
A) y = 2.96x + 67,428
B) y = 2.96x + 5619
C) y = -2.96x + 5619
D) y = -2.96x + 67,428

Answer: A

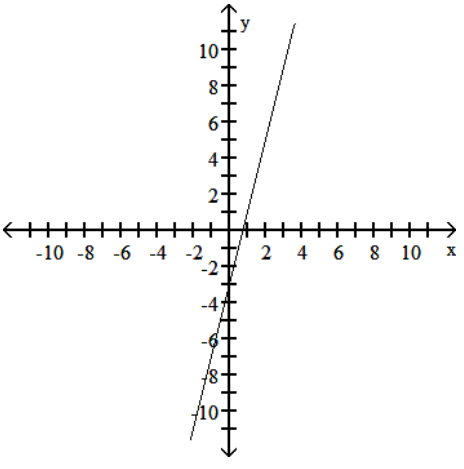
Explanation: A)
B)
C)
D)

Graph the equation.

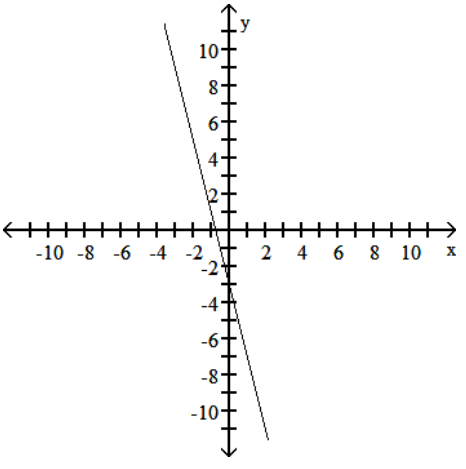
103) 4x + y = -3 103) ____



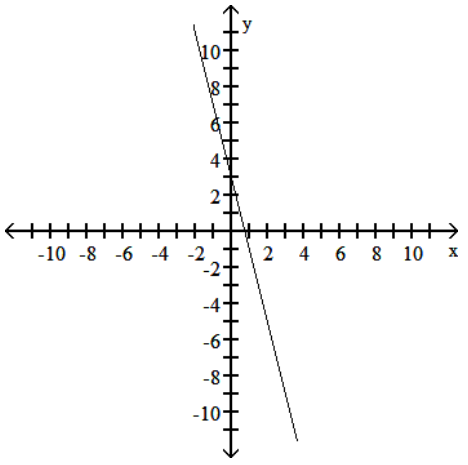
A)



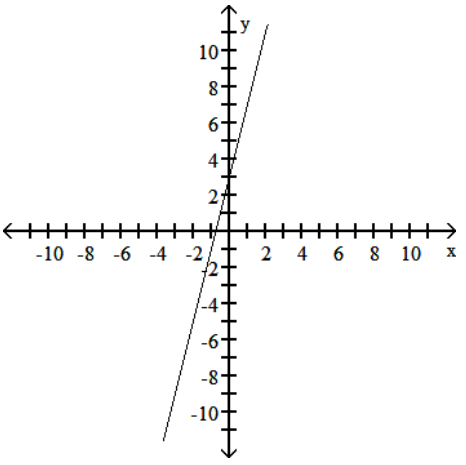
B)



C)



D)



Answer: B

Explanation: A)

B)

C)

D)

Solve the problem.

104) In a lab experiment 14 grams of acid were produced in 16 minutes and 19 grams in 23 minutes. Let y be the grams produced in x minutes. Write a linear equation for grams produced. 104) ____

A) $y = \frac{5}{7}x - \frac{18}{7}$ B) $y = \frac{7}{5}x - \frac{18}{7}$ C) $y = \frac{5}{7}x + \frac{18}{7}$ D) $y = -\frac{5}{7}x - \frac{18}{7}$

Answer: C

Explanation: A)

B)

C)

D)

105) Let the demand and supply functions be represented by D(p) and S(p), where p is the price in dolla 105) ____

Find the equilibrium price and equilibrium quantity for the given functions.

D(p) = 3328 - 50p

S(p) = 210p - 832

A) $19; 2528 B) $16; 2528 C) $26; 2028 D) $19; 2378

Answer: B

Explanation: A)

B)

C)

D)

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

106) (4, -5) and (5, -10) 106) ____

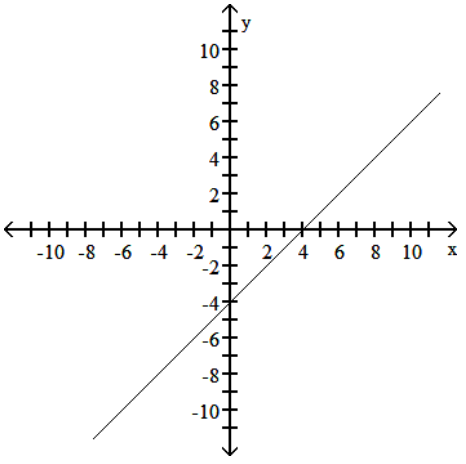
A) $-\frac{5}{3}$ B) $-\frac{1}{5}$ C) 5 D) -5

Answer: D

Explanation: A)
B)
C)
D)

Find the slope of the line.

107) 107) ____



A) 1 B) 4 C) -4 D) -1

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

108) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.45 as soon as you get in the taxi, to which a charge of $2.30 per mile is added. Find a linear equation that can be used to determine the cost, C, of an x-mile taxi ride. 108) ____

A) C = 4.75x B) C = 3.25x

C) C = 2.30x + 2.45 D) C = 2.45x + 2.30

Answer: C

Explanation: A)
B)
C)
D)

Find the slope of the line.

109) A line parallel to $2x = 5y + 9$ 109) ____

A) $\frac{9}{2}$ B) $-\frac{2}{5}$ C) $\frac{2}{5}$ D) $\frac{5}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

110) The following data show the list price, x, in thousands of dollars, and the dealer invoice price, y, als 110) ____
thousands of dollars, for a variety of sport utility vehicles. Find a linear equation that approximates
data, using the points (16.5, 16.1) and (20.0, 18.3).

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) $y = 1.59x - 10.2$
C) $y = 0.629x + 6.38$ D) $y = 0.629x + 5.73$

Answer: D

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

111) The following are costs of advertising (in thousands of dollars) and the number of products sold (ir 111) ____
thousands):

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) 0.7077 D) -0.0707

Answer: C

Explanation: A)
B)
C)
D)

Find the slope of the line.

112) $y = \frac{5}{6}x$ 112) ____

A) 1 B) $\frac{5}{6}$ C) $\frac{6}{5}$ D) 0

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

113) For some reason the quality of production decreases as the year progresses at a light bulb manufact 113) ____
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.

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 ligh
bulbs would be 1.83%.

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

Answer: D

Explanation: A)
B)
C)
D)

114) When going more than 38 miles per hour, the gas mileage of a certain car fits the model 114) ____
$y = 43.81 - 0.395x$ 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.)

A) 48 miles per hour B) 73 miles per hour
C) 149 miles per hour D) 98 miles per hour

Answer: B

Explanation: A)
B)
C)
D)

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

115) (-3, 6) and (-5, 6) 115) ____

A) Not defined B) - 6 C) 0 D) $-\frac{3}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

116) The paired data below consist of the temperatures on randomly chosen days and the amount a cert kind of plant grew (in millimeters). 116) ____

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 - 0.112x

C) y = 7.30 + 0.122x D) y = 14.6 + 0.211x

Answer: D

Explanation: A)
B)
C)
D)

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

117) Through (-5, 8) and (3, -9) 117) ____

A) $y = \frac{13}{12}x - \frac{23}{4}$ B) $y = -\frac{13}{12}x - \frac{23}{4}$

C) $y = -\frac{17}{8}x - \frac{21}{8}$ D) $y = \frac{17}{8}x - \frac{21}{8}$

Answer: C

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

118) Find $g\left(\frac{1}{4}\right)$ when $g(x) = 7 - 7x$. 118) ____

A) $-\frac{1}{2}$ B) 35 C) 21 D) - 21

Answer: D

Explanation: A)
B)
C)
D)

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

119) Through (-4, -3), perpendicular to $9x - 5y = -51$ 119) ____

A) $y = \frac{4}{5}x - \frac{51}{5}$ B) $y = \frac{5}{9}x - \frac{47}{9}$ C) $y = -\frac{9}{5}x - \frac{9}{5}$ D) $y = -\frac{5}{9}x - \frac{47}{9}$

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

120) Suppose the sales of a particular brand of appliance satisfy the relationship $S = 170x + 5900$, where S represents the number of sales in year x, with x = 0 corresponding to 1982. Find the number of sal in
1990. 120) ____

A) 14,520 sales B) 7090 sales C) 14,350 sales D) 7260 sales

Answer: D

Explanation: A)
B)
C)
D)

121) A lumber yard has fixed costs of $2682.80 a day and variable costs of $1.00 per board-foot produced. The company gets $2.90 per board-foot sold. How many board-feet must be produced daily to break even? 121) ____

A) 941 board-feet B) 2682 board-feet
C) 687 board-feet D) 1412 board-feet

Answer: D

Explanation: A)
B)
C)
D)

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

122) (5, 4) and (3, 8) 122) ____

A) - 2 B) $-\frac{1}{2}$ C) 2 D) $\frac{3}{2}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

123) 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, 24,800) and (3, 26,500). 123) ____

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

A) y = 850x + 23,950 B) y = -1098x + 23,950

C) y = 850x D) y = 28.2x + 23,950

Answer: A

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

124) Find f(-r) when f(x) = 5 - 2x. 124) ____

A) r - 2x B) 5 - 2r C) 5 + 2r D) 5 + rx

Answer: C

Explanation: A)
B)
C)
D)

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

125) Through (2, -4) and (2, -9) 125) ____

A) $-\frac{9}{4}x - 4y = 0$ B) $x = 2$ C) $-\frac{4}{9}x - 9y = 0$ D) $y = -4$

Answer: B

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

126) The paired data below consist of the test scores of 6 randomly selected students and the number of they studied for the test. 126) ____

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

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

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

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

127) The outdoor temperature rises to 13° Fahrenheit. What is this temperature in Celsius? 127) ____

A) 13° B) -19° C) 7.2° D) -10.6°

Answer: D

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

128) Two different tests are designed to measure employee productivity and dexterity. Several employe 128) ____
company are randomly selected and asked to complete the tests. The results are below.

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) $y = 5.05 + 1.91x$

C) $y = 2.36 + 2.03x$ D) $y = 75.3 - 0.329x$

Answer: B

Explanation: A)
B)
C)
D)

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

129) Through $(-8, 6)$, with undefined slope 129) ____

A) $x = -8$ B) $y = 6$ C) $\frac{3}{4}x - 8y = 0$ D) $\frac{4}{3}x + 6y = 0$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

130) 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 92, 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? 130) ____

A) 450 B) 405 C) 585 D) 315

Answer: B

Explanation: A)
B)
C)
D)

131) 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, 24,400) and (3, 26,600). Then use this function to predict the salary for the year 2007. 131) ____

Year, x	Salary, y
1990, 0	$23,500
1991, 1	$24,400
1992, 2	$25,200
1993, 3	$26,600
1994, 4	$27,200

A) $42,220 B) $42,200 C) $42,180 D) $42,240

Answer: B

Explanation: A)
B)
C)
D)

Find the slope of the line.

132) x = 10 132) ____

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

Answer: A

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

133) Find f(-6.5) when f(x) = -3x - 6.9. 133) ____

A) -26.4 B) 12.6 C) 26.4 D) 18.81

Answer: B

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

134) In the table below, x represents the number of years since 2000 and y represents the population (in thousands) of the town Boomville. 134) ____

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

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

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

135) The bank's temperature display shows that it is 36° Celsius. What is the temperature in Fahrenheit? 135) ____

A) 37.8° B) 122.4° C) 96.8° D) 2.2°

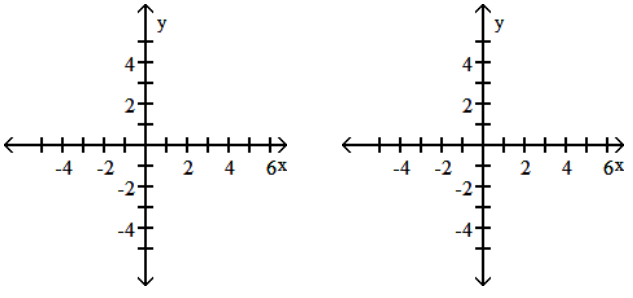
Answer: C

Explanation: A)
B)
C)
D)

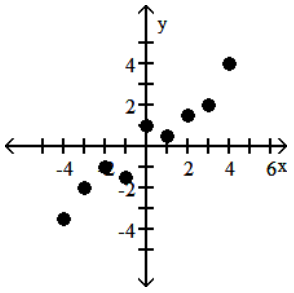
136) For the following table of data, 136) ____

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 -23.

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

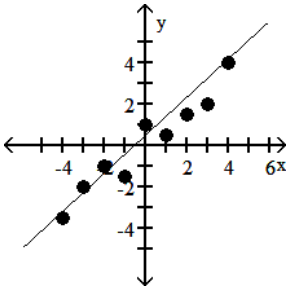


A) a.



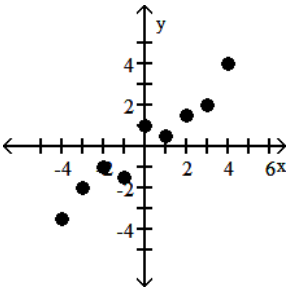
b. 0.966

c. Y = 0.82x - 0.11



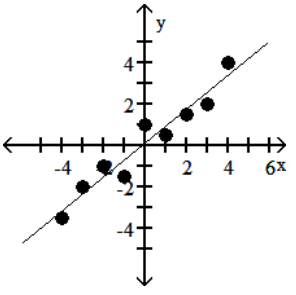
d. -18.97

B) a.



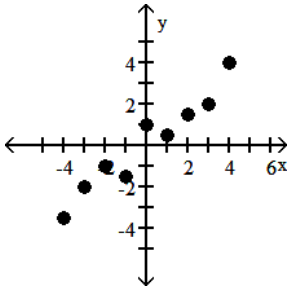
b. 0.966

c. Y = 0.82x + 0.11



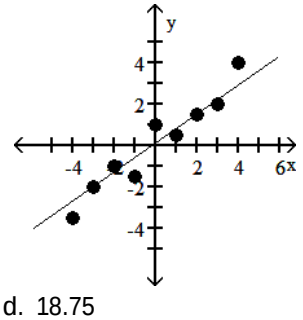
d. -18.75

C) a.



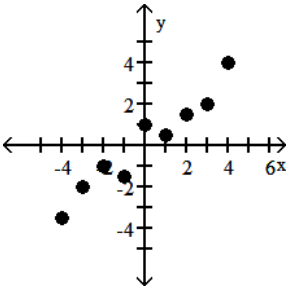
b. -0.966

c. Y = -0.82x - 0.11



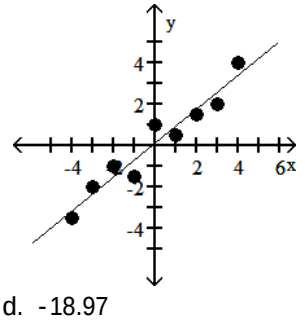
d. 18.75

D) a.



b. -0.966

c. Y = 0.82x + 0.11



d. -18.97

Answer: B

Explanation: A)

B)

C)

D)

137) Regrind, Inc. regrinds used typewriter platens. The cost per platen is $1.20. The cost to regrind 100 platens is $400. Find the linear cost function to regrind platens. If reground platens sell for $8.80 each, how many must be reground and sold to break even? 137) ____

A) C(x) = 1.20x + 280
break-even = 288

B) C(x) = 1.20x + 400
break-even = 41

C) C(x) = 1.20x + 280
break-even = 37

D) C(x) = 1.20x + 400
break-even = 54

Answer: C

Explanation: A)
B)
C)
D)

Evaluate the function as indicated.

138) Find g(a - 1) when g(x) = 4x - 5. 138) ____

A) 4a - 9 B) $\frac{1}{4}$a - 5 C) 4a + 1 D) 4a - 5

Answer: A

Explanation: A)
B)
C)
D)

Find the slope of the line.

139) 4x + 5y = -8 139) ____

A) $-\frac{4}{5}$ B) $-\frac{8}{5}$ C) $\frac{5}{4}$ D) $\frac{4}{5}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

140) Let the demand and supply functions be represented by D(p) and S(p), where p is the price in dolla 140) ____
Find the equilibrium price and equilibrium quantity for the given functions.
D(p) = 117,250 - 240p
S(p) = 430p

A) $190; 71,650 B) $175; 75,250 C) $272; 51,970 D) $190; 75,250

Answer: B

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

141) Managers rate employees according to job performance and attitude. The results for several randor selected employees are given below. 141) ____

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

Answer: D

Explanation: A)
B)
C)
D)

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

142) (4, 6) and (8, 7) 142) ____

A) 4
B) $-\frac{1}{4}$
C) $\frac{13}{12}$
D) $\frac{1}{4}$

Answer: D

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

143) Consider the data points with the following coordinates: 143) ____

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

Answer: A

Explanation: A)
B)
C)
D)

144) Consider the data points with the following coordinates: 144) ____

x	16.8	30.8	20.6	22.4	10.6
y	3	5	10	9	4

A) 0
B) 0.2911
C) 0.2591
D) -0.2911

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

145) Find the temperature at which the Celsius and Fahrenheit scales coincide. 145) ____

A) -25° B) 0° C) 39° D) -40°

Answer: D

Explanation: A)
B)
C)
D)

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

146) Through (5, 2) and (0, -2) 146) ____

A) $y = -\frac{4}{5}x - 2$ B) $y = \frac{4}{5}x - 2$ C) $y = -\frac{3}{2}x - 2$ D) $y = \frac{3}{2}x - 2$

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

147) Suppose that the demand and price for a certain model of graphing calculator are related by $p = D(q) = 99 - 3q$, where p is the price (in dollars) and q is the demand (in hundreds). Find the price if the demand is 300 calculators. 147) ____

A) $108.00 B) $189.00 C) $9.00 D) $90.00

Answer: D

Explanation: A)
B)
C)
D)

148) 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 5 hours. 148) ____

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

A) 77.7 B) 74.8 C) 67.7 D) 72.7

Answer: D

Explanation: A)
B)
C)
D)

149) After two years on the job, an engineer's salary was $45,000. After seven years on the job, her salary was $57,500. 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. 149) ____

A) y = 12,500x + 20,000
B) y = 2500x + 45,000
C) y = 12,500x + 45,000
D) y = 2500x + 40,000

Answer: D

Explanation: A)
B)
C)
D)

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

150) Fixed cost, $30; 5 items cost $4460 to produce 150) ____

A) C(x) = 1772x + 30
B) C(x) = 1772x + 4460
C) C(x) = 886x + 30
D) C(x) = 886x + 4460

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

151) On a summer day, the bottom water of a lake is at a temperature of 5° Celsius. What is this temperature in Fahrenheit? 151) ____

A) 5°
B) 9°
C) 37°
D) 41°

Answer: D

Explanation: A)
B)
C)
D)

Find the equation of the least squares line.

152) 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. 152) ____

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

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

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

153) A car rental company charges $24 per day to rent a particular type of car and $0.15 per mile. Juan is charged $43.80 for a one-day rental. How many miles did he drive? 153) ____

A) 147 mi B) 268 mi C) 132 mi D) 292 mi

Answer: C

Explanation: A)
B)
C)
D)

154) Midtown Delivery Service delivers packages which cost $1.70 per package to deliver. The fixed cost to run the delivery truck is $84 per day. If the company charges $7.70 per package, how many packages must be delivered daily to break even? 154) ____

A) 8 packages B) 49 packages C) 9 packages D) 14 packages

Answer: D

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

155) The following are costs of advertising (in thousands of dollars) and the number of products sold (ir thousands): 155) ____

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

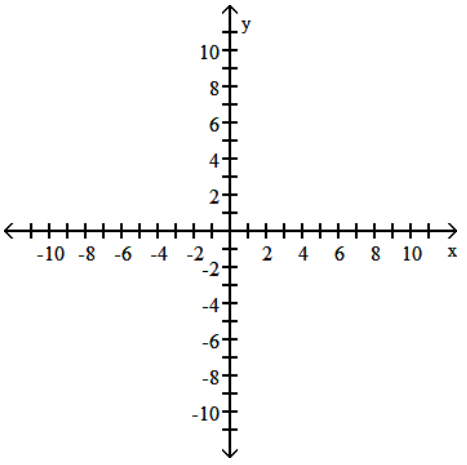
A) 0.2635 B) -0.3707 C) 0.6756 D) 0.6112

Answer: D

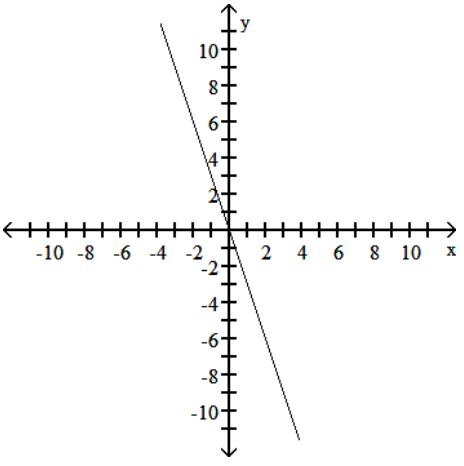
Explanation: A)
B)
C)
D)

Graph the equation.

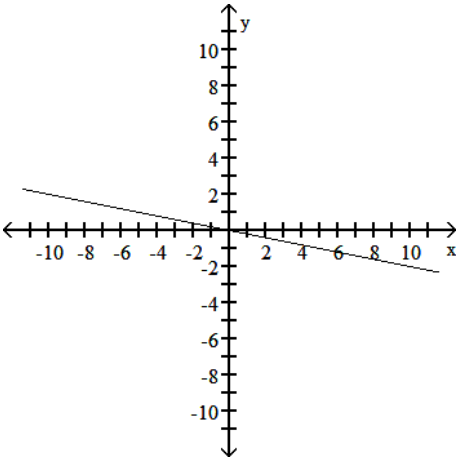
156) $3x - 15y = 0$ 156) ____



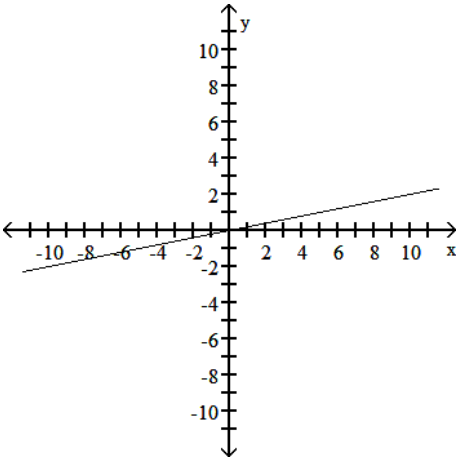
A)



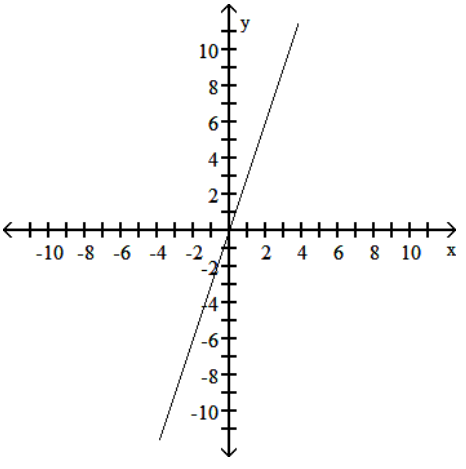
B)



C)



D)



Answer: C

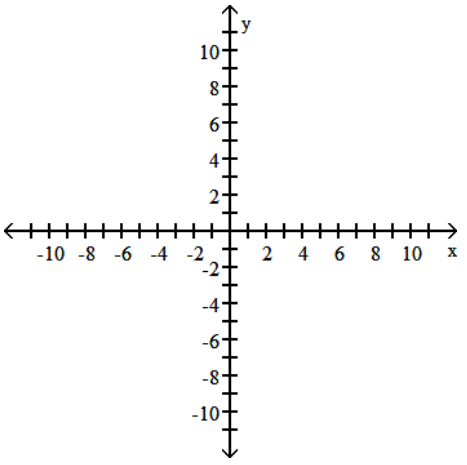
Explanation: A)

B)

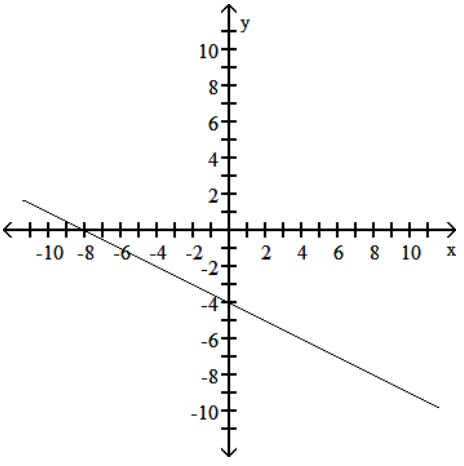
C)

D)

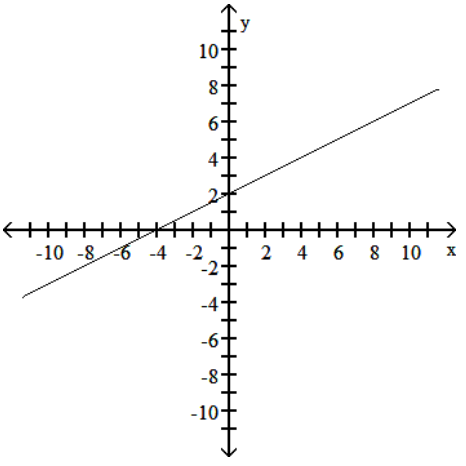
157) $y = -\frac{1}{2}x - 4$ 157) ____



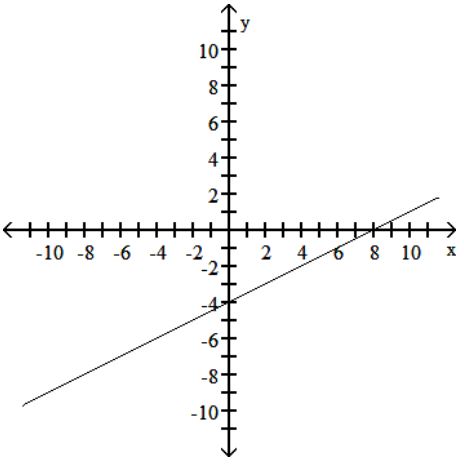
A)



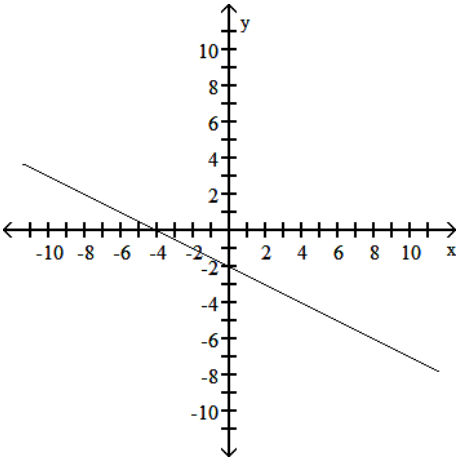
B)



C)



D)



Answer: A

Explanation: A)
B)
C)
D)

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

158) Through (3, 0), m = -1 158) ____

A) y = -x + 3 B) y = 3x C) y = -3x D) y = x - 3

Answer: A

Explanation: A)
B)
C)
D)

Find the correlation coefficient.

159) The test scores of 6 randomly picked students and the number of hours they prepared are as follow 159) ____

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

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

Answer: B

Explanation: A)
B)
C)
D)

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

160) Through (5, 2), m = $-\frac{5}{6}$ 160) ____

A) $y = -\frac{5}{6}x + \frac{25}{6}$ B) $y = \frac{5}{6}x + \frac{25}{6}$ C) $y = \frac{5}{6}x - \frac{37}{6}$ D) $y = -\frac{5}{6}x + \frac{37}{6}$

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

161) A meteorologist in the Upper Peninsula of Michigan predicts an overnight low of -14° Fahrenheit. 161) ____
What would a Canadian meteorologist predict for the same location in Celsius?

A) -7.8° B) -25.6° C) -46° D) -14°

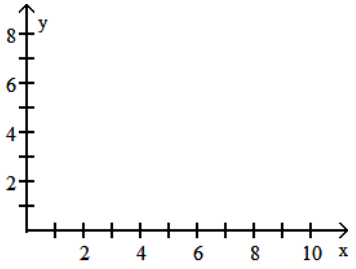
Answer: B

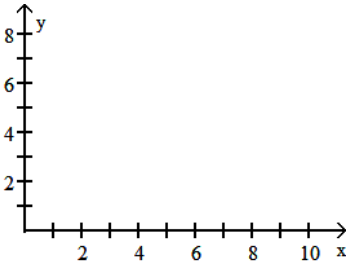
Explanation: A)
B)
C)
D)

162) For the following table of data, 162) ____

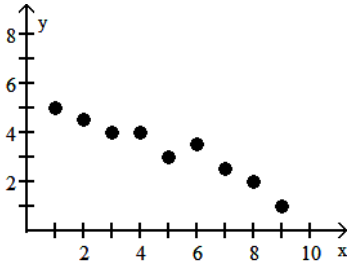
a. Draw a scatterplot.
b. Calculate the correlation coefficient.
c. Calculate the least squares line and graph it on the scatterplot.
d. Predict the y-value when x is 15.

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



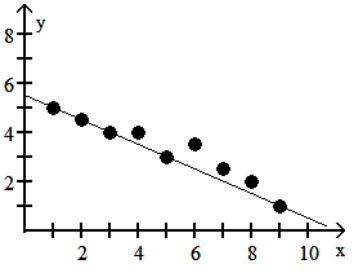


A) a.



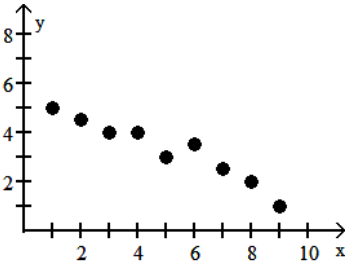
b. 0.965

c. Y = -0.45x + 5.53



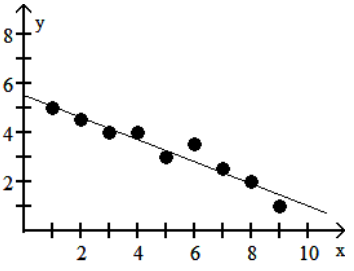
d. -1.22

B) a.



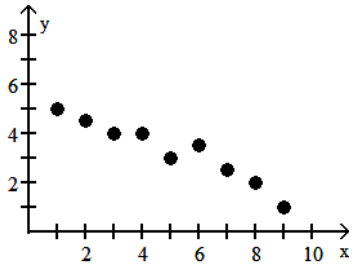
b. -0.965

c. Y = -0.45x + 5.53



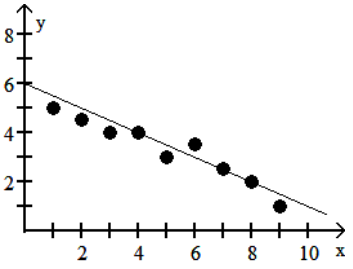
d. -1.22

C) a.



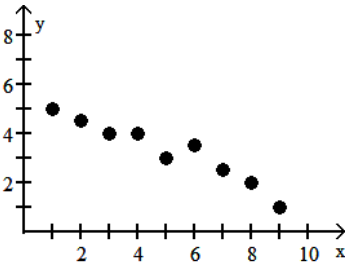
b. 0.965

c. Y = 0.45x - 5.53



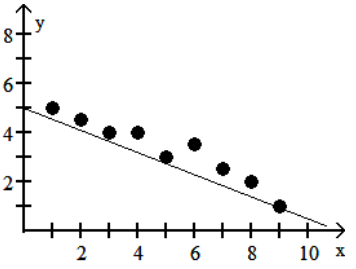
d. 1.22

D) a.



b. -0.965

c. Y = -0.45x - 5.53



d. -12.28

Answer: B

Explanation: A)

B)

C)

D)

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

163) (7, -7) and (7, -2) 163) ____

A) $-\frac{5}{14}$ B) Not defined C) 0 D) $-\frac{9}{14}$

Answer: B

Explanation: A)

B)

C)

D)

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

164) Through (5, 7), parallel to -9x + 7y = -31 164) ____

A) $y = -\frac{5}{7}x - \frac{31}{7}$ B) $y = -\frac{9}{7}x - \frac{4}{7}$ C) $y = \frac{9}{7}x + \frac{4}{7}$ D) $y = \frac{7}{9}x - \frac{7}{9}$

Answer: C

Explanation: A)

B)

C)

D)

165) Through (-2, -8), perpendicular to -8x - 3y = 40 165) ____

A) $y = \frac{8}{3}x - 58$ B) $y = \frac{3}{8}x - \frac{29}{4}$ C) $y = \frac{3}{8}x$ D) $y = -\frac{3}{8}x + \frac{29}{4}$

Answer: B

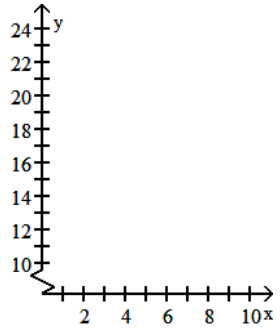
Explanation: A)
B)
C)
D)

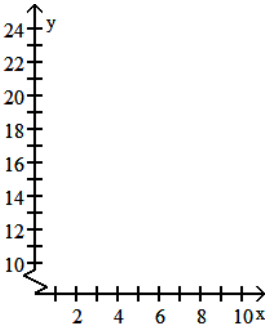
Solve the problem.

166) For the following table of data, 166) ____

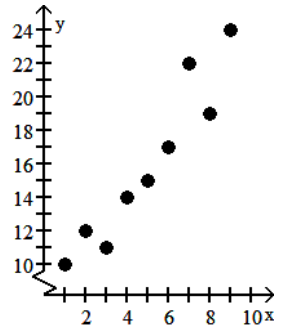
a. Draw a scatterplot.
b. Calculate the correlation coefficient.
c. Calculate the least squares line and graph it on the scatterplot.
d. Predict the y-value when x is 19.

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



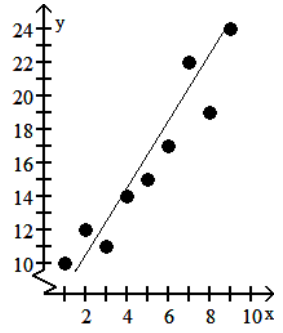


A) a.



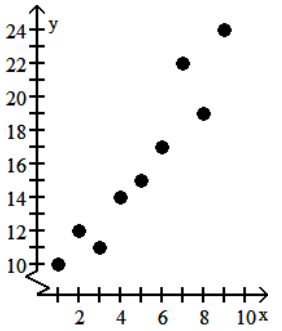
b. 0.903

c. Y = 2x + 6.5



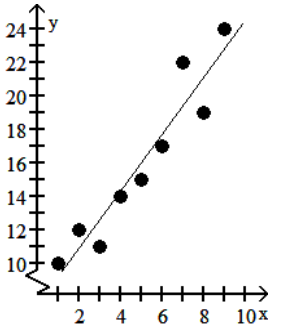
d. 44.5

B) a.



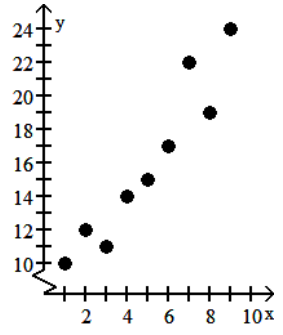
b. 0.950

c. Y = 1.7x + 8.5



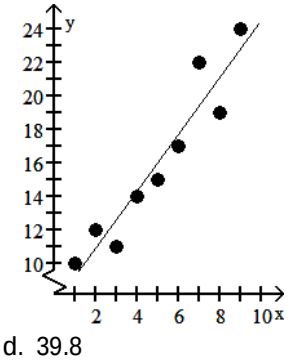
d. 40.8

C) a.



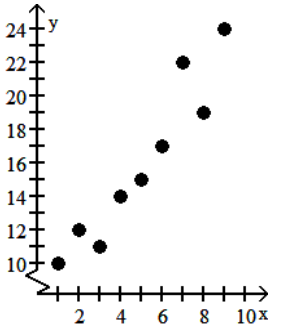
b. 0.950

c. Y = 1.7x + 7.5



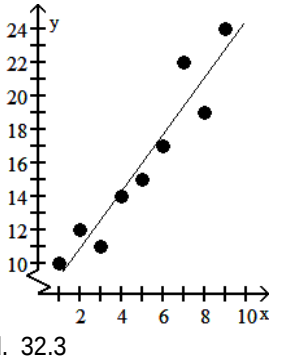
d. 39.8

D) a.



b. 0.950

c. Y = 1.7x



d. 32.3

Answer: C

Explanation: A)

B)

C)

D)

1) An equation such as by + c = 0 has a slope of zero. (Answers may vary.)
2) 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 $m = \frac{4 - 4}{7 - 3} = \frac{0}{4} = 0$.
3) 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.)
4) 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.
5) 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.
6) Fixed costs occur only once. These costs may be startup costs related to the production of the new product. Variable 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 c of materials.
7) 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.
8) 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.)
9) The slope of 800 indicates that during his 12 years at the school, John's salary has increased by approximately $800 per year.
10) A
11) D
12) A
13) C
14) B
15) B
16) B
17) A
18) D
19) D
20) B
21) A
22) C
23) B
24) D
25) D
26) B
27) D

28) C
29) D
30) C
31) D
32) B
33) B
34) C
35) A
36) A
37) A
38) B
39) C
40) D
41) B
42) A
43) B
44) C
45) B
46) A
47) B
48) C
49) A
50) C
51) D
52) C
53) A
54) C
55) D
56) D
57) D
58) B
59) C
60) C
61) B
62) B
63) B
64) B
65) D
66) B
67) C
68) B
69) A

70) D
71) C
72) B
73) A
74) A
75) B
76) A
77) D
78) C
79) A
80) C
81) D
82) A
83) D
84) A
85) D
86) B
87) D
88) C
89) D
90) C
91) B
92) D
93) C
94) C
95) A
96) C
97) C
98) D
99) D
100) B
101) B
102) A
103) B
104) C
105) B
106) D
107) A
108) C
109) C
110) D
111) C

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

154) D
155) D
156) C
157) A
158) A
159) B
160) D
161) B
162) B
163) B
164) C
165) B
166) C