Exam

Name_____

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

Solve the problem. Express your answer as an integer or simplified fraction.

1) $-\frac{1}{5}(x-15)+\frac{1}{6}(x+6)=x+6$ 1) _____

A) $\left\{-\frac{120}{31}\right\}$ B) $\left\{-\frac{60}{31}\right\}$ C) $\left\{-\frac{240}{31}\right\}$ D) $\left\{-\frac{300}{31}\right\}$

Answer: B

2) $7x-(5x-1)=2$ 2) _____

A) $-\frac{1}{12}$ B) $\frac{1}{2}$ C) $\frac{1}{12}$ D) $-\frac{1}{2}$

Answer: B

3) $\frac{x}{6}-4=\frac{x}{3}-3$ 3) _____

A) - 14 B) - 2 C) 14 D) - 6

Answer: D

4) $-3(4x+5)-1=-5(x+2)+4x$ 4) _____

A) $\left\{-\frac{6}{11}\right\}$ B) $\left\{-\frac{6}{13}\right\}$ C) $\left\{\frac{14}{11}\right\}$ D) $\left\{\frac{2}{11}\right\}$

Answer: A

5) $\frac{5x-7}{5}=\frac{7x+3}{2}$ 5) _____

A) $-\frac{29}{25}$ B) $\frac{29}{45}$ C) $-\frac{1}{25}$ D) $\frac{1}{45}$

Answer: A

6) $\frac{x}{16}-\frac{5}{8}=\frac{x+6}{8}$ 6) _____

A) - 22 B) - 11 C) - 16 D) - 17

Answer: A

7) Solve: $\frac{x-2}{3}-\frac{x-3}{6}=\frac{3-x}{2}-3$ 7) _____

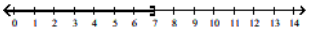
A) 3 B) - 3 C) - 2 D) 2

Answer: C

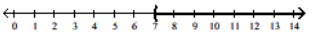
Solve the inequality and graph. Express your answer in interval notation.

8) $7x + 4 > 6x + 11$ 8) _____

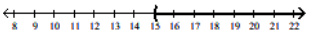
A) $(-\infty, 7]$



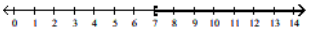
B) $(7, \infty)$



C) $(15, \infty)$



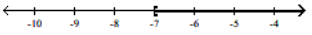
D) $[7, \infty)$



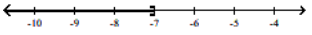
Answer: B

9) $-4(3x - 2) < -16x - 20$ 9) _____

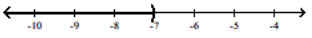
A) $[-7, \infty)$



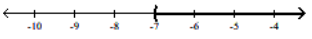
B) $(-\infty, -7]$



C) $(-\infty, -7)$



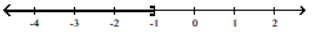
D) $(-7, \infty)$



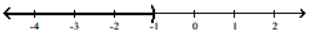
Answer: C

10) $16x - 4 > 4(3x - 2)$ 10) _____

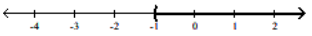
A) $(-\infty, -1]$



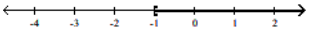
B) $(-\infty, -1)$



C) $(-1, \infty)$



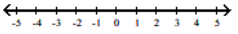
D) $[-1, \infty)$



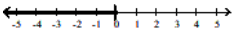
Answer: C

11) $-4(-2 - x) < 6x + 19 - 11 - 2x$ 11) _____

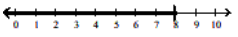
A) $(-\infty, \infty)$



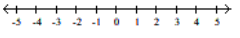
B) $(-\infty, 0)$



C) $(-\infty, 8)$



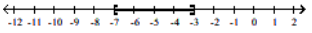
D) $\emptyset$



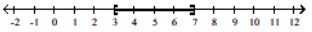
Answer: D

12) $-20 \le -3x + 1 \le -8$ 12) _____

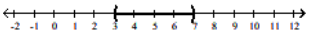
A) [-7, -3]



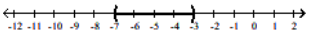
B) [3, 7]



C) (3, 7)



D) (-7, -3)



Answer: B

Solve the formula for the specified variable.

13) $S = 2\pi rh + 2\pi r^2$ for h 13) _____

A) $h = \frac{S}{2\pi r} - 1$ B) $h = 2\pi(S - r)$ C) $h = \frac{S - 2\pi r^2}{2\pi r}$ D) $h = S - r$

Answer: C

14) $7x + 10y = 19$ for y 14) _____

A) $-7x - 10y = -19$ B) $y = \frac{7}{10}x + \frac{19}{10}$

C) $y = 7x - 19$ D) $y = -\frac{7}{10}x + \frac{19}{10}$

Answer: D

15) $F = \frac{9}{5}C + 32$ for C 15) _____

A) $C = \frac{9}{5}(F - 32)$ B) $C = \frac{F - 32}{9}$ C) $C = \frac{5}{9}(F - 32)$ D) $C = \frac{5}{F - 32}$

Answer: C

16) Solve: $D = \frac{4}{5}(mx - mb)$ for m 16) _____

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

Answer: B

Solve the problem.

17) Find the Celsius temperature (to the nearest degree) when Fahrenheit temperature is 50° by solving the equation $50 = \frac{9}{5}C + 32$, where F is the Fahrenheit temperature (in degrees) and C is the Celsius temperature. 17) _____

A) 122°C B) 24°C C) 96°C D) 10°C

Answer: D

18) At a local grocery store the demand for ground beef is approximately 50 pounds per week when the price per pound is $4, but is only 40 pounds per week when the price rises to $5.50 per pound. Assuming a linear relationship between the demand x and the price per pound p, express the price as a function of demand. Use this model to predict the demand if the price rises to $5.80 per pound. 18) _____

A) p = 0.15x + 11.5; 38 pounds B) p = - 0.15x - 11.5; 40 pounds

C) p = - 0.15x + 11.5; 38 pounds D) p = 11.5x + -0.15; 40 pounds

Answer: C

19) Assume that the price per unit d of a certain item to the consumer is given by the equation d = 35 - .10x, where x is the number of units in demand. The price per unit from the supplier is given by the equation s = .2x + 20, where x is the number of units supplied. Find the equilibrium price and the equilibrium quantity. 19) _____

A) equilibrium price: $35 per unit; equilibrium quantity: 50 units

B) equilibrium price: $30 per unit; equilibrium quantity: 50 units

C) equilibrium price: $50 per unit; equilibrium quantity: 30 units

D) equilibrium price: $20 per unit; equilibrium quantity: 50 units

Answer: B

20) A piece of equipment was purchased by a company for $10,000 and is assumed to have a salvage value of $3,000 in 10 years. If its value is depreciated linearly from $10,000 to $3,000, find a linear equation in the form V = mt + b, t time in years, that will give the salvage value at any time t, $0 \le t \le 10$. 20) _____

A) V = - 700t - 10,000 B) T = - 700V + 10,000

C) V = 700t + 10,000 D) V = - 700t + 10,000

Answer: D

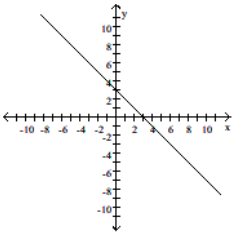
21) You have $50,000 and wish to invest part at 10% and the rest at 6%. How much should be invested at each rate to produce the same return as if it all had been invested at 9%? 21) _____

A) $37,000 at 6%, $13,000 at 10% B) $37,500 at 6%, $12,500 at 10%

C) $37,000 at 10%, $13,000 at 6% D) $37,500 at 10%, $12,500 at 6%

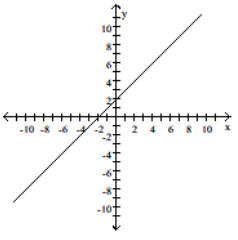
Answer: D

Determine whether the slope of the line is positive, negative, zero, or undefined.

22)  22) _____

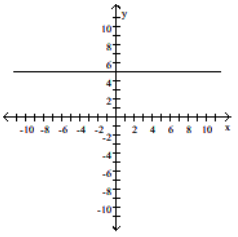
A) negative B) positive C) undefined D) zero

Answer: A

23)  23) _____

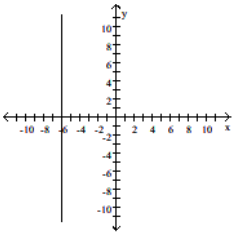
A) undefined B) negative C) positive D) zero

Answer: C

24)  24) _____

A) undefined B) zero C) negative D) positive

Answer: B

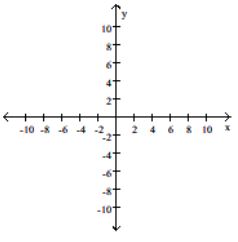
25)  25) _____

A) positive B) undefined C) negative D) zero

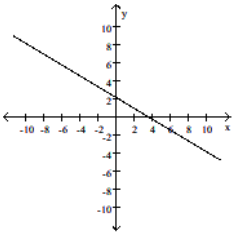
Answer: B

Graph the linear equation and determine its slope, if it exists.

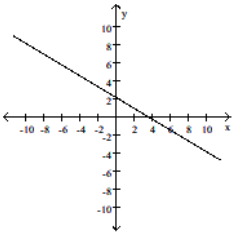
26) $3x + 5y = 11$ 26) _____



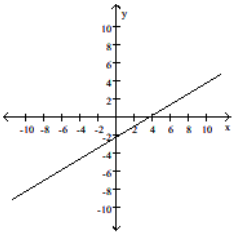
A) slope: $-\frac{3}{4}$



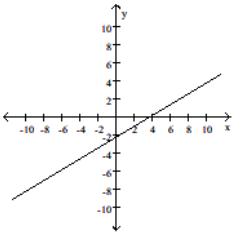
B) slope: $\frac{3}{4}$



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

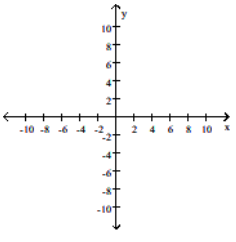


D) slope: $-\frac{3}{4}$

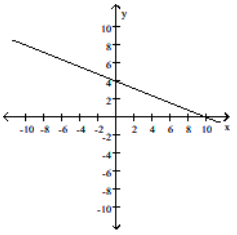


Answer: A

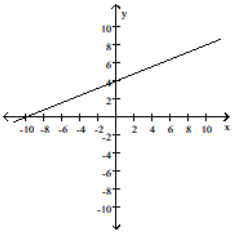
27) $2x - 5y = 20$ 27) _____



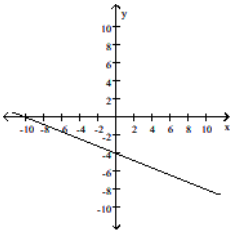
A) slope = $-\frac{2}{5}$



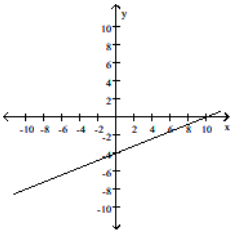
B) slope = $\frac{2}{5}$



C) slope = $-\frac{2}{5}$



D) slope = $\frac{2}{5}$



Answer: D

Find the slope and y intercept of the graph of the equation.

28) y = 3x - 6 28) _____

A) Slope = 3, y intercept = 6
B) Slope = 6, y intercept = 3
C) Slope = -6, y intercept = 3
D) Slope = 3, y intercept = -6

Answer: D

29) y = -4x + 7 29) _____

A) Slope = -4, y intercept = 7
B) Slope = -7, y intercept = -4
C) Slope = 7, y intercept = -4
D) Slope = 4, y intercept = -7

Answer: A

30) $y = \frac{5}{2}x - \frac{3}{2}$ 30) _____

A) Slope = $-\frac{3}{2}$; y intercept = $\frac{5}{2}$ B) Slope = $\frac{5}{2}$; y intercept = $-\frac{3}{2}$

C) Slope = $\frac{3}{2}$; y intercept = $\frac{5}{2}$ D) Slope = $\frac{5}{2}$; y intercept = $\frac{3}{2}$

Answer: B

31) $y = -\frac{1}{2}x + 3$ 31) _____

A) Slope = 2; y intercept = 1 B) Slope = $\frac{1}{2}$; y intercept = 3

C) Slope = $-\frac{1}{2}$; y intercept = 3 D) Slope = $\frac{1}{2}$; y intercept = 1

Answer: C

32) $y = -\frac{x}{2} - 6$ 32) _____

A) Slope = $-\frac{1}{2}$; y intercept = 6 B) Slope = -6; y intercept = $\frac{1}{2}$

C) Slope = $-\frac{1}{2}$; y intercept = -6 D) Slope = -6; y intercept = $-\frac{1}{2}$

Answer: C

33) $y = x - 5$ 33) _____

A) Slope = -5; y intercept = 1 B) Slope = -5; y intercept = -1

C) Slope = 0; y intercept = 5 D) Slope = 1; y intercept = -5

Answer: D

Write an equation of the line with the indicated slope and y intercept.

34) Slope = 3, y intercept = -4 34) _____

A) y = 3x - 4 B) y = -3x - 4 C) y = 4x - 3 D) y = 4x + 3

Answer: A

35) Slope = -3, y intercept = 5 35) _____

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

Answer: A

36) Slope = $\frac{5}{2}$; y intercept = $-\frac{3}{2}$ 36) _____

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

Answer: A

37) Slope = $-\frac{4}{5}$; y intercept = $\frac{18}{5}$ 37) _____

A) $y = -\frac{4}{5}x + \frac{18}{5}$ B) $y = -\frac{5}{4}x + \frac{18}{5}$ C) $y = \frac{4}{5}x + \frac{8}{5}$ D) $y = -\frac{4}{5}x - \frac{18}{5}$

Answer: A

38) Slope = $-\frac{1}{2}$; y intercept = 4 38) _____

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

Answer: B

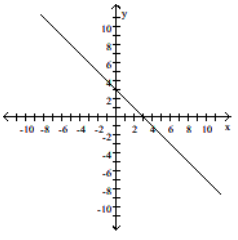
39) Slope = 1; y intercept = -4 39) _____

A) y = -x - 4 B) y = -4x - 1 C) y = x - 4 D) y = -4x + 1

Answer: C

Provide an appropriate response.

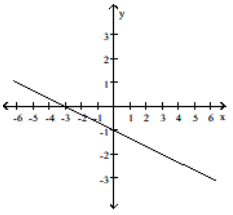
40) Use the graph to find the slope-intercept form of the equation of the line. 40) _____



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

Answer: C

41) Write the equation of the line in the following graph. 41) _____



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

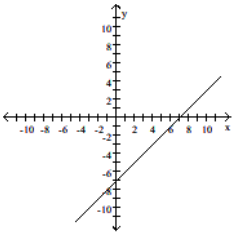
Answer: C

42) Find the slope of the line $3x + 4y = 11$. 42) _____

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

Answer: C

43) Use the graph to find the slope, x-intercept and y-intercept of the line. 43) _____



A) slope = -1
x-intercept = (7, 0)
y-intercept = (0, -7)

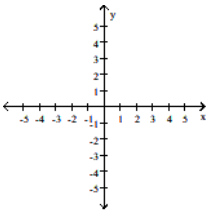
B) slope = 1
x-intercept = (0, 7)
y-intercept = (-7, 0)

C) slope = 1
x-intercept = (7, 0)
y-intercept = (0, -7)

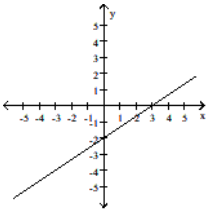
D) slope = - 1
x-intercept = (-7, 0)
y-intercept = (0, 7)

Answer: C

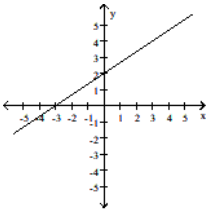
44) Graph the linear function defined by $f(x) = \frac{2}{3}x + 2$ and indicate the slope and intercepts. 44) _____



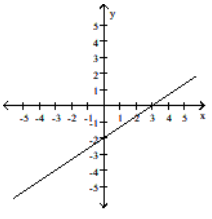
A) x-intercept = 3; y-intercept = -2; slope $\frac{2}{3}$



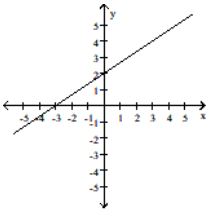
B) x-intercept = -3; y-intercept = 2; slope $\frac{2}{3}$



C) x-intercept = -2; y-intercept = 3; slope $\frac{2}{3}$



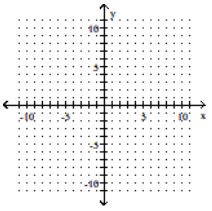
D) x-intercept = 2; y-intercept = -3; slope $\frac{2}{3}$



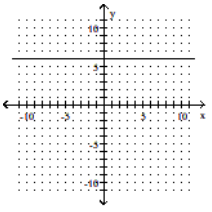
Answer: B

Graph the equation.

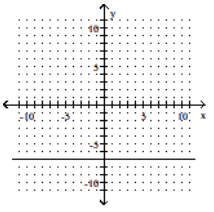
45) 42 + 7y = 0 45) _____



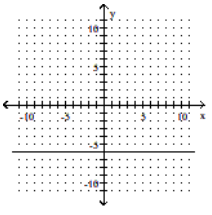
A)



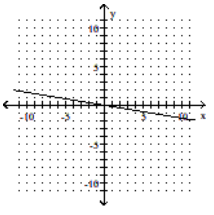
B)



C)



D)



Answer: C

Provide an appropriate response.

46) Find the line passing through the two points. Write the equation in standard form. 46) _____
(10, 9) and (10, 1)

A) x + y = 19 B) x + y = 11 C) y = 9 D) x = 10

Answer: D

47) Find the line passing through the two points. Write the equation in standard form. 47) _____
(-3, 6) and (6, 6)

A) -2x - y 0 B) -x - 2y = 0 C) y = 6 D) x = -2

Answer: C

Write the slope-intercept equation (y = mx + b) for a line with the given characteristics.

48) m = - 4, y-intercept (0, -7) 48) _____

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

Answer: D

49) m = 3, passing through (1, -2) 49) _____

A) y = 3x - 5 B) y = 5x - 3 C) y - 5 = 3x D) y = 3x

Answer: A

Provide an appropriate response.

50) Find the standard form of the equation of the line with slope of $-\frac{2}{7}$ and passing through (4, 4). 50) _____

A) 2x - 7y = 36 B) 2x + 7y = - 36 C) 2x + 7y = 36 D) 7x + 2y = - 36

Answer: C

Find the slope of the line containing the given points.

51) (5, -2); (-6, 2) 51) _____

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

Answer: D

52) (6, 1) and (6, - 4) 52) _____

A) - 4 B) $-\frac{1}{4}$ C) 0 D) Undefined

Answer: D

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

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

Answer: A

Provide an appropriate response.

54) Find the standard form of the equation of the line passing through the two points. 54) _____
(2, - 6) and (- 9, 6)

A) 12x + 11y = - 42 B) - 12x + 11y = - 42

C) 8x - 15y = - 18 D) - 8x + 15y = - 18

Answer: A

55) Write the equation of a line that passes through (3, 9) and (0, -7). Write the final answer in the form Ax + By = C where A, B, and C are integers with no common divisors (other than ±1) and A > 0. 55) _____

A) -16x + 3y = 21 B) 3x - 16y = 21 C) 16x - 3y = -21 D) 16x - 3y = 21

Answer: D

56) Write the equation of a line that passes through (-1, 4) and (5, -1). Write the final answer in the form Ax + By = C where A, B, and C are integers with no common divisors (other than ±1) and A > 0. 56) _____

A) -5x + 6y = 19 B) 5x - 6y = 19 C) 5x + 6y = 19 D) 5x + 6y = -19

Answer: C

Solve the problem.

57) The cost of manufacturing a computer part is related to the quantity produced, x, during a production run. When 100 parts are produced, the cost is $300. When 600 parts are produced, the cost is $4800. Find an equation of the line relating quantity produced to cost. Write the final answer in the form C = mx + b. 57) _____

A) C = 600x + 9 B) C = 9x C) C = 9x - 600 D) C = 9x + 600

Answer: C

58) The cost for labor associated with fixing a washing machine is computed as follows: There is a fixed charge of $25 for the repairman to come to the house, to which a charge of $20 per hour is added. Find an equation that can be used to determine the labor cost, C, of a repair that takes x hours. Write the final answer in the form C = mx + b. 58) _____

A) C = 45x B) C = 20x + 25 C) C = -20x + 25 D) C = 25x + 20

Answer: B

59) A small company that makes hand-sewn leather shoes has fixed costs of $320 a day, and total costs of $1200 per day at an output of 20 pairs of shoes per day. Assume that total cost C is linearly related to output x. Find an equation of the line relating output to cost. Write the final answer in the form C = mx + b. 59) _____

A) C = 60x + 320 B) C = 60x + 1520 C) C = 44x + 320 D) C = 44x + 1520

Answer: C

60) Using a phone card to make a long distance call costs a flat fee of $0.85 plus per $0.19 minute starting with the first minute. Find the total cost of a phone call which lasts 8 minutes. 60) _____

A) $2.37 B) $1.52 C) $8.16 D) $6.00

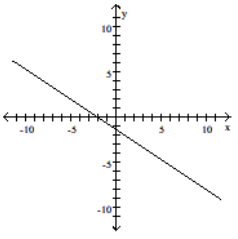
Answer: A

61) The mathematical model C = 600 x + 30,000 represents the cost in dollars a company has in manufacturing x items during a month. Using this model, how much does it cost to produce 600 items? 61) _____

A) $390,000 B) $0.08 C) $50.00 D) $360,000

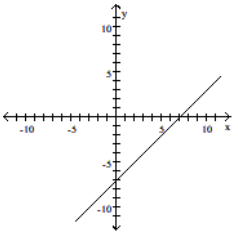
Answer: A

Use the graph to find the average rate of change.

62)  62) _____

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

Answer: C

63)  63) _____

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

Answer: D

Provide an appropriate response.

64) Given two points (x_1, y_1) and (x_2, y_2), the ratio of the change in y to the change in x is called. 64) _____

A) equilibrium point B) break-even point
C) slope D) x-intercept

Answer: C

Use the REGRESSION feature on a graphing calculator.

65) The paired data below consists of the temperature on randomly chosen days and the amount of a certain kind of plant grew (in millimeters). 65) _____

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

Find the linear function that predicts a plant's growth as a function of the temperature. Round your answer to two decimal places.

A) $y = -9.19x^3 + 0.11x^2 - 2.90x + 6.54$ B) $y = 0.21x + 14.57$

C) $y = 14..57x + 0.21$ D) $y = -0.06x^2 + 7.20x - 191.23$

Answer: B

66) The use of bottled water in the United States has shown a steady increase in recent years. The table shows the annual per capita consumption for the years 1995 - 2001. 66) _____

Year	1995	1996	1997	1998	1999	2000	2001
Gallons/person	4.4	5.1	5.7	6.4	7.3	8.0	10.2

With x being the years since 1995, find the linear function that represents this data. Round your answer to two decimal places.

A) $y = 0.89x + 4.07$ B) $y = 4.07x + 0.89$

C) $y = 0.04x^3 - 0.23x^2 + 1.01x + 4.35$ D) $y = 0.1x^2 + 0.29x + 4.57$

Answer: A

67) 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. 67) _____

Hours in lab	10	11	16	9	7	15	16	10
Grade (percent)	96	51	62	58	89	81	46	51

Use linear regression to find a linear function that predicts a student's course grade as a function of the number of hours spent in lab.

A) $y = 0.930 + 44.3x$ B) $y = 44.3 + 0.930x$

C) $y = 1.86 + 88.6x$ D) $y = 88.6 - 1.86x$

Answer: D

68) In the table below, x represents the number of years since 2000 and y represents sales (in thousands of dollars) of a clothing company. Use the regression equation to estimate sales in the year 2006. Round to the nearest thousand dollars. 68) _____

Year x	1	2	3	4	5
Sales y	84	76	39	30	26

A) $8,000 B) $2,000 C) $14,000 D) $20,000

Answer: B

69) For some reason the quality of production decreased as the year progressed at a flash drive manufacturing plant. The following data represent the percentage of defective flash drives produced at the plant in the corresponding month of the year. 69) _____

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 regression equation with values rounded to four decimals to predict the percentage of defective drives in month 6, June.

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

Answer: B

70) Efficiency experts rate employees according to job performance and attitude. The results for several randomly selected employees are given below. 70) _____

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

Find the regression line which can be used to predict performance rating if attitude rating is known.

A) $y = 92.3 - 0.669x$ B) $y = -47.3 + 2.02x$

C) $y = 11.7 + 1.02x$ D) $y = 2.81 + 1.35x$

Answer: C

Solve the problem.

71) Suppose the sales of a particular brand of MP3 player satisfy the relationship $S = 200x + 3800$, where S represents the number of sales in year x, with $x = 0$ corresponding to 2002 . Find the number of sales in 2005. 71) _____

A) 4200 B) 12,600 C) 4400 D) 6400

Answer: C