MATH 1710 College Algebra
Final Exam Review

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

Solve the problem.

1) There were 480 people at a play. The admission price was $2 for adults and $1 for children. The admission receipts were $770. How many adults and how many children attended? 1) _____

A) 192 adults and 288 children
B) 290 adults and 190 children
C) 95 adults and 385 children
D) 190 adults and 290 children

2) A store is discounting all regularly priced items by 30%. (i) Find a function f that computes the sale price of an item having a regular price of x. (ii) If an item normally costs $199.54, what is its sale price? 2) _____

A) f(x) = x - 30; $169.54
B) f(x) = 0.3x; $59.86
C) f(x) = x - 0.3; $199.24
D) f(x) = x - 0.3x; $139.68

3) Your company uses the quadratic model $y = -4.5x^2 + 150x$ to represent the average number of new customers who will be signed on (x) weeks after the release of your new service. How many new customers can you expect to gain in week 14? 3) _____

A) 1218 customers
B) 609 customers
C) 168 customers
D) 2037 customers

4) Let f(x) compute the cost of a rental car after x days of use at $50 per day. What does $f^{-1}(x)$ compute? 4) _____

A) The number of days rented for 50 dollars
B) The cost of rental for x days
C) The cost of rental for 50 days
D) The number of days rented for x dollars

5) If x dollars is deposited every four weeks (13 times a year) into an account paying an annual interest rate r, expressed in decimal form, then the amount A_n in the account after n years can be approximated by the formula $A_n = x\left[\frac{(1 + r/13)^{13n} - 1}{r/13}\right]$. 5) _____

If a retirement account pays 9% annual interest, determine how much a 20-year-old worker would have to deposit in this account every 4 weeks in order to have a million dollars at age 65.

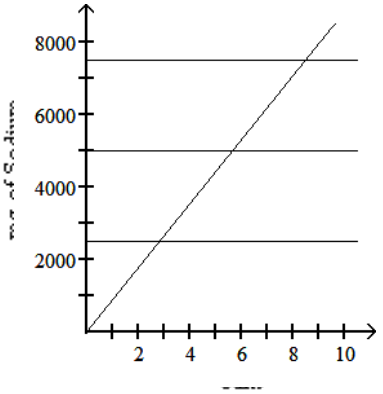
A) $68.06
B) $124.51
C) $6806.16
D) $12,451.12

6) Brand A soup contains 883 milligrams of sodium. It is recommended that a person requiring 2000 calories daily consume 2500 mg of sodium or less per day. Graph the function, f, that computes the number of mg of sodium in x cans of soup together with $y_1 = 2500$, $y_2 = 5000$, $y_3 = 7500$ in [0, 10, 1] by [0, 8000, 1000]. Use the intersection-of-graphs method to find how many cans of soup contain 1, 2, and 3 daily allowances of sodium. 6) _____

mg of Sodium

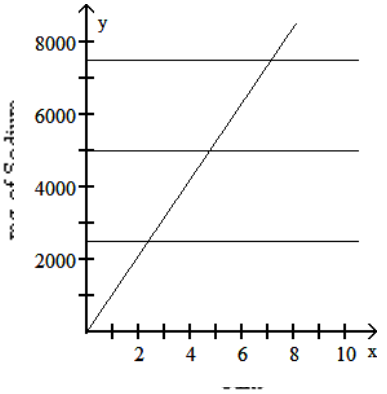
Cans

A)



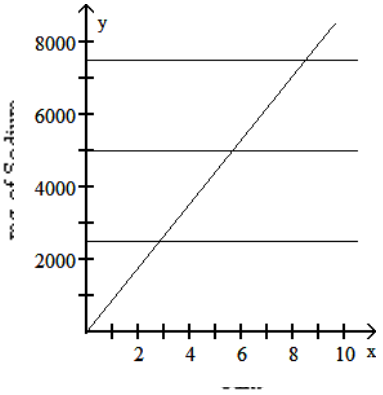
1 allowance = 3 cans;
2 allowances = 6 cans;
3 allowances = 8 cans

B)



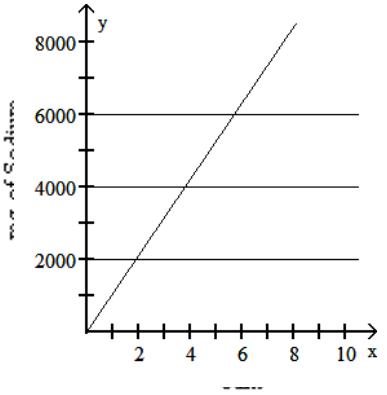
1 allowance = 2 cans;
2 allowances = 5 cans;
3 allowances = 7 cans

C)



1 allowance = 6 cans;
2 allowances = 8 cans;
3 allowances = 3 cans

D)

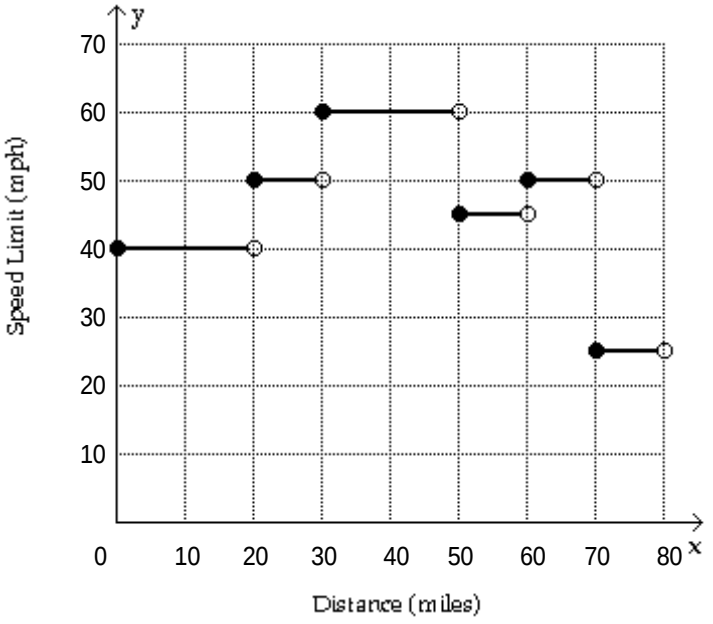


1 allowance = 3 cans;
2 allowances = 6 cans;
3 allowances = 8 cans

7) The inequality $|T - 40| \leq 7.1$ describes the range of monthly average temperatures T in degrees Fahrenheit at a City X. (i) Solve the inequality. (ii) If the high and low monthly average temperatures satisfy equality, interpret the inequality. 7) _____

A) $-42.7 \leq T \leq 45.4$; The monthly averages are always within 5.4° of 40°F.
B) $-47.1 \leq T \leq 54.2$; The monthly averages are always within 14.2° of 40°F.
C) $37.3 \leq T \leq 42.7$; The monthly averages are always within 2.7° of 40°F.
D) $32.9 \leq T \leq 47.1$; The monthly averages are always within 7.1° of 40°F.

8) 8) _____

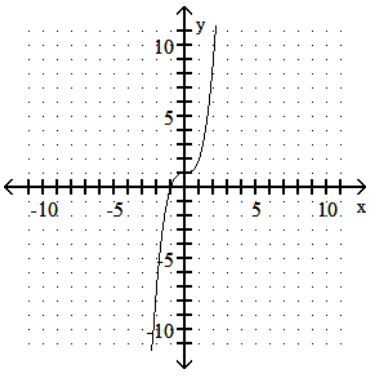


The graph of y = f(x) gives the speed limit y along a rural highway after traveling x miles. (i) What are the maximum and minimum speed limits along this stretch of highway? (ii) Estimate the miles of highway with a speed limit of 50 miles per hour.

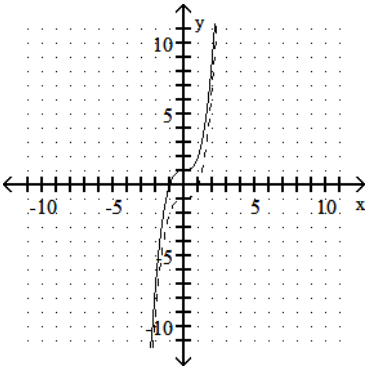
A) Maximum 70 mph; minimum 20 mph; 15 miles
B) Maximum 65 mph; minimum 25 mph; 22.5 miles
C) Maximum 60 mph; minimum 35 mph; 20 miles
D) Maximum 60 mph; minimum 25 mph; 20 miles

Use the graph of f to sketch a graph of the inverse of f using a dashed curve.

9) 9) _____



A)



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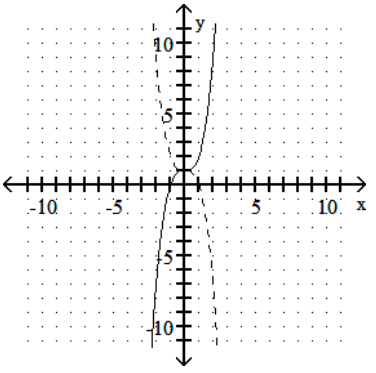

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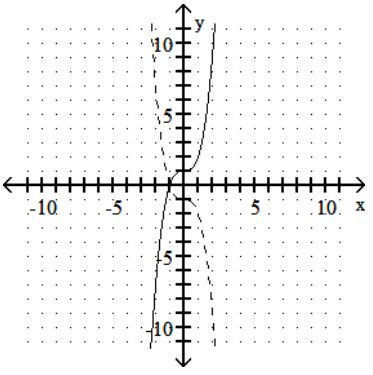

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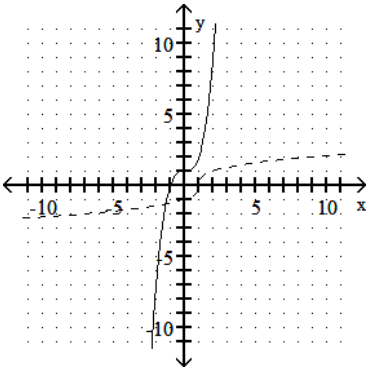


Find the probability of the compound event.

10) Two 6-sided dice are rolled. What is the probability the sum of the two numbers on the die will be 3? 10) _____

A) $\frac{1}{2}$ B) 2 C) $\frac{17}{18}$ D) $\frac{1}{18}$

Solve the problem.

11) In order to receive a B in a course, it is necessary to get an average of 80% correct on two one-hour exams of 100 points each, on one midterm exam of 200 points, and on one final exam of 500 points. If a student scores 90, and 85 on the one-hour exams, and 148 on the midterm exam, what is the minimum score on the final exam that the person can get and still earn a B? 11) _____

A) 442 B) 397 C) 307 D) 577

12) 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 $29 per hour is added. Find an equation that can be used to determine the labor cost, C(x), of a repair that takes x hours. 12) _____

A) C(x) = 25 + 29x
B) C(x) = 25 - 29x
C) C(x) = (25 + 29) x
D) C(x) = 29 + 25x

Solve the logarithmic equation symbolically.

13) $\log x^8 = 3 + 6 \log x$ 13) _____

A) $x = 810^9$
B) $x = 10^{3/2}$
C) $x = 10^{9/8}$
D) $x = \frac{10^3}{2}$

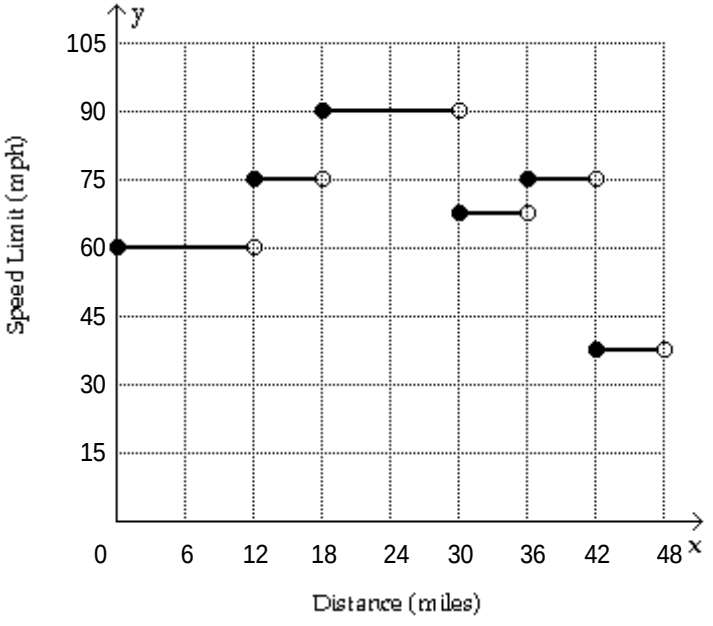
Use common or natural logarithms to solve the exponential equation symbolically.

14) $2^{(5 - 3x)} = \frac{1}{16}$ 14) _____

A) x = -3.4
B) x = 3.4
C) x = -3
D) x = 3

Solve the problem.

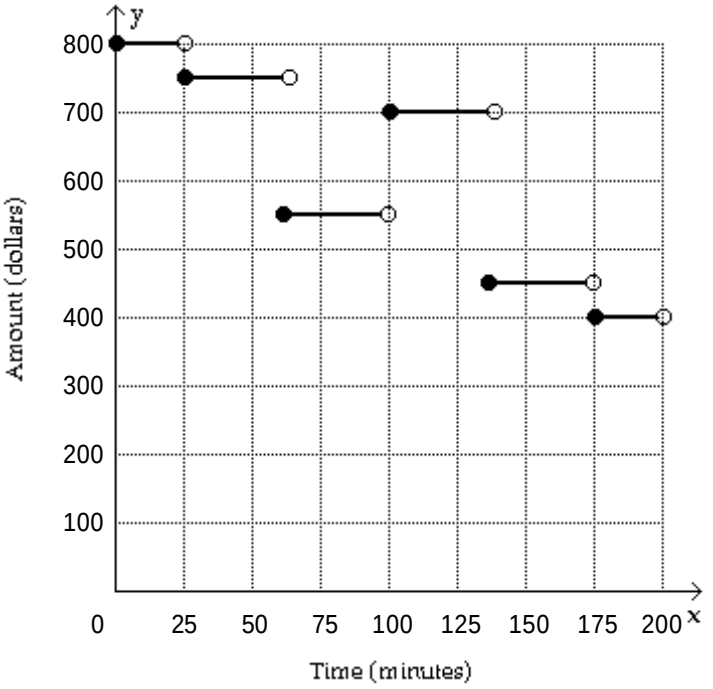
15) 15) _____



The graph of y = f(x) gives the speed limit y along a rural highway after traveling x miles. (i) Evaluate f(12), f(33), and f(36). (ii) At what x-values is the graph discontinuous?

A) 60, 75, 75; f(3), f(12), f(24), f(30), and f(36)
B) 60, 60, 75; f(6), f(12), f(18), f(36), and f(42)
C) 75, 67.5, 75; f(12), f(18), f(30), f(36), and f(42)
D) 67.5, 75, 90; f(6), f(12), f(18), f(30), and f(36)

16) 16) _____



The graph of y = f(x) depicts the amount of cash y in dollars that a bank teller has at his station after x minutes. (i) When did the largest withdrawal occur? (ii) How much was it?

A) After 25 minutes; $150
B) After 62.5 minutes; $250
C) After 137.5 minutes; $150
D) After 137.5 minutes; $250

17) A salesman sold $250 more than the rest of the sales staff. If the sales total for the day was $1250, how much did the rest of the sales staff sell? 17) _____

A) $750 B) $625 C) $1000 D) $500

18) The inequality $|T - 42| \leq 19$ describes the range of monthly average temperatures T in degrees Fahrenheit at a City X. (i) Solve the inequality. (ii) If the high and low monthly average temperatures satisfy equality, interpret the inequality. 18) _____

A) $23 \leq T \leq 61$; The monthly averages are always within 19° of 42°F.
B) $18 \leq T \leq 66$; The monthly averages are always within 24° of 42°F.
C) $18 \leq T$; The monthly averages are always greater than or equal to 18°F.
D) $T \leq 61$; The monthly averages are always less than or equal to 61°F.

19) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Express F as a linear function of c. 19) _____

A) F(c) = 33.8c B) F(c) = 1.8c + 32 C) F(c) = 1.8 + 32c D) $F(c) = \frac{c - 32}{1.8}$

Solve.

20) In how many ways can the letters in the word PAYMENT be arranged if the letters are taken 4 at a time? 20) _____

A) 210 B) 28 C) 420 D) 840

Solve the logarithmic equation symbolically.

21) ln 3x + ln 6x = ln 19 21) _____

A) x = 1 B) $x = \frac{e^{19}}{18}$ C) $x = \left(\frac{19}{18}\right)^{1/2}$ D) x = 0

Solve the problem.

22) The following table gives the outside temperature in degrees Fahrenheit on a winter day in Death V 22) _____
California.

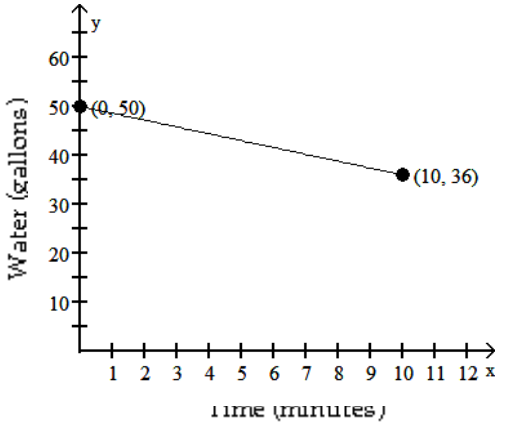
Time	7:00 am	8:00 am	9:00 am	10:00 am	11:00 am
Temperature (°F)	78	84	85	91	95

Calculate the average rate of change in temperature between 7:00 am and 10:00 am. Round your ans two decimal places when appropriate.

A) 44.25°F B) 4.33°F C) .23°F D) 3.98°F

23) Sketch a graph that depicts the amount of water in a 50-gallon tank. The tank is initially full, and 23) _____
then a pump is used to take water out of the tank at a rate of 4 gallons per minute. The pump is turned off after 5 minutes. At that point, the pump is changed to one that will pump water into the tank. The change takes 2 minutes and the water level is unchanged during the switch. Then, water is pumped into the tank at a rate of 2 gallons per minute for 3 minutes.

A)



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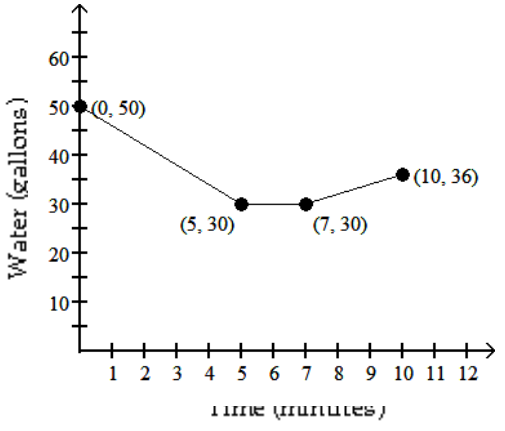

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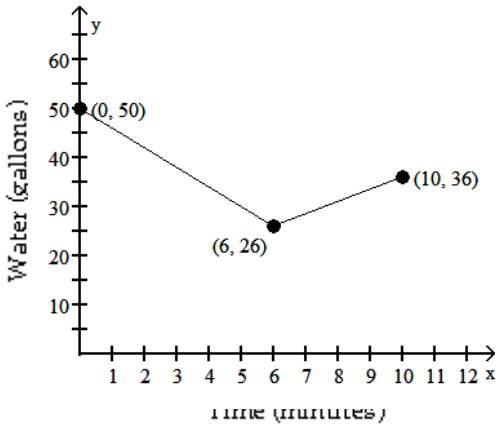

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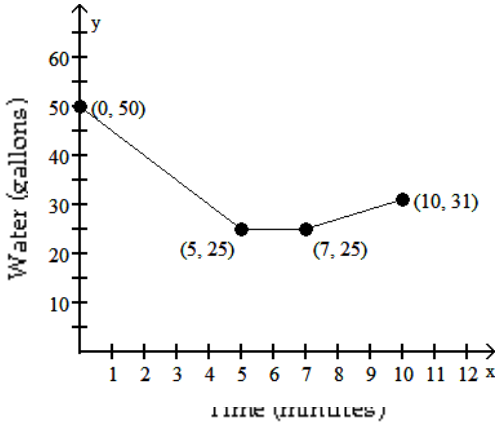
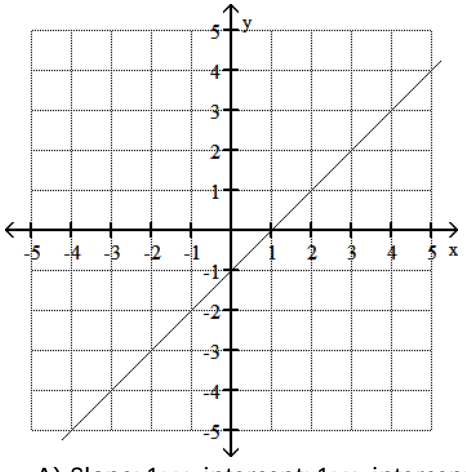


Identify the slope, y-intercept, and x-intercept.

24) 24) _____



A) Slope: 1; y-intercept: 1; x-intercept: -1

B) Slope: 1; y-intercept: -1; x-intercept: 1

C) Slope: 3; y-intercept: -1; x-intercept: 1

D) Slope: -1; y-intercept: 1; x-intercept: -1

Find the probability of the compound event.

25) If two 8-sided dice are rolled what is the probability that both numbers will be even? 25) _____

A) $\frac{1}{2}$ B) $\frac{31}{64}$ C) $\frac{33}{64}$ D) $\frac{1}{4}$

Complete numerical representations for the functions f and g are given. Evaluate the expression, if possible.

26) $(g \circ f)(1)$ 26) _____

x	1	5	11	12
f(x)	-1	11	0	13

x	-5	-1	1	3
g(x)	1	-5	5	11

A) -1 B) 11 C) -5 D) 5

Compute the average rate of change of f from x_1 to x_2. Round your answer to two decimal places when appropriate. Interpret your result graphically.

27) $f(x) = -3x + 4$, $x_1 = -5$ and $x_2 = -2$ 27) _____

A) 3; the slope of the line passing through (-5, f(-5)) and (-2, f(-2)) is 3.
B) -4; the slope of the line passing through (-5, f(-5)) and (-2, f(-2)) is -4.
C) -3; the slope of the line passing through (-5, f(-5)) and (-2, f(-2)) is -3.
D) 2; the slope of the line passing through (-5, f(-5)) and (-2, f(-2)) is 2.

Solve the problem.

28) In Country X, the average hourly wage in dollars from 1945 to 1995 can be modeled by 28) _____

$$f(x) = \begin{cases} 0.077(x - 1945) + 0.34 & \text{if } 1945 \le x < 1970 \\ 0.186(x - 1970) + 3.03 & \text{if } 1970 \le x \le 1995 \end{cases}$$

Use f to estimate the average hourly wages in 1950, 1970, and 1990.

A) \$0.73, \$3.03, \$6.75 B) \$3.42, \$0.34, \$6.75 C) \$0.73, \$2.27, \$6.75

29) If an object is dropped off of a tower, the velocity, V, of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Express V as a linear function of t. 29) _____

A) V(t) = 42t B) $V(t) = \frac{t-10}{32}$ C) V(t) = 32t + 10 D) V(t) = 32 + 10t

Solve the inequality symbolically. Express the solution set in interval notation.

30) $6 + 5y - 9 \ge 4y + 3$ 30) _____

A) $(-\infty, 6]$ B) $(-\infty, 5)$ C) $[6, \infty)$ D) $(5, \infty)$

Specify the domain of the function.

31) $f(x) = 2x^2 + 6x - 1$ 31) _____

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

Solve the equation.

32) $|r + 2| = 4$ 32) _____

A) -2 B) -6, 2 C) No solution D) 6, 2

Solve the problem.

33) Determine whether the ordered triple (2, 9, -4) is a solution of the system of equations. 33) _____

$2x - 5y - 9z = -5$
$x + y + z = 7$
$3x - y + 5z = 35$

A) Yes B) No

34) The perimeter of a rectangle is 22 cm. One side is 5 cm longer than the other side. Find the lengths of the sides. 34) _____

A) 4, 9 B) 3, 8 C) 3, 5 D) 6, 11

Solve.

35) There are 5 women running in a race. How many first, second, and third place possibilities can occur? 35) _____

A) 125 B) 60 C) 15 D) 10

36) In how many ways can 7 people line up for play tickets? 36) _____

A) 7 B) 823,543 C) 1 D) 5040

Write the system of linear equations that the augmented matrix represents.

37) 37) _____

$$\left[\begin{array}{ccc|c} 5 & 5 & 3 & -2 \\ 4 & 0 & 7 & 4 \\ 8 & 9 & 0 & 2 \end{array}\right]$$

A) $5x + 5y + 3z = -2$
$4x + 7z = 4$
$8x + 9y = 2$

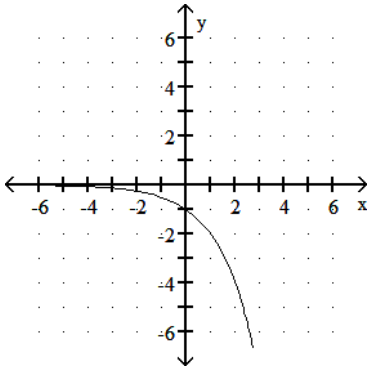
B) $5x + 5y + 3z = -2$
$3x + 4z = 4$
$8x + 9y = 2$

C) $5x + 5y + 3z = -2$
$4x + 7z = -4$
$8x + 9y = 2$

Graph the exponential function.

38) $y = 2^{-x}$ 38) _____

A)



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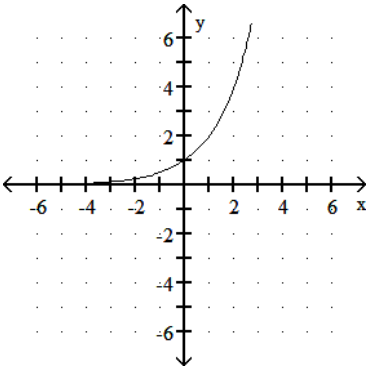

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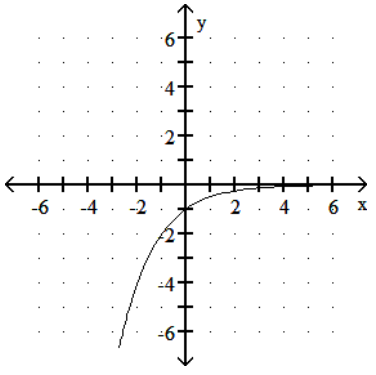

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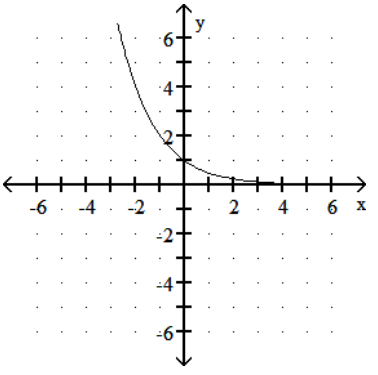


Specify the domain of the function.

39) $f(x) = \dfrac{(x + 8)(x - 8)}{x^2 + 64}$ 39) _____

A) $x > 64$

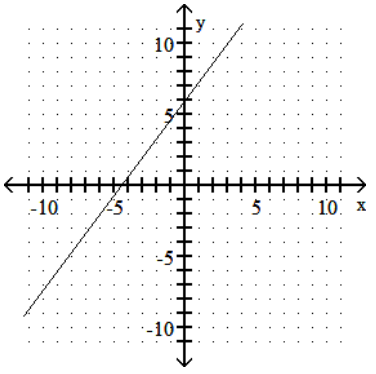
B) $x \neq 8, x \neq -8$

C) $x \neq 64$

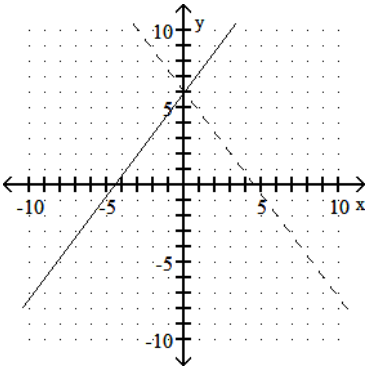
D) All real numbers

Use the graph of f to sketch a graph of the inverse of f using a dashed curve.

40) 40) _____



A)



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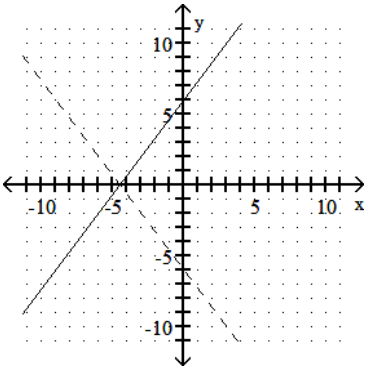

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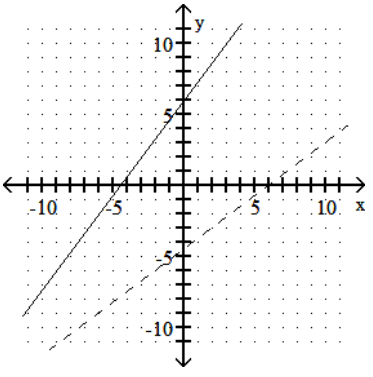

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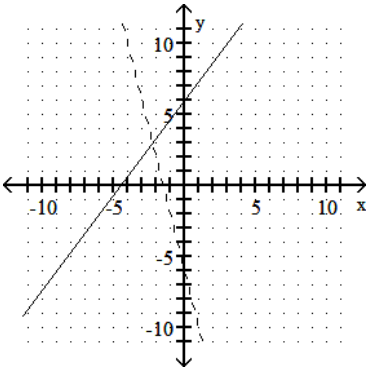
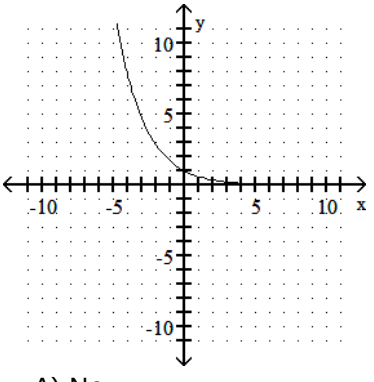


Use the graph to determine whether the function is one-to-one.

41) 41) _____



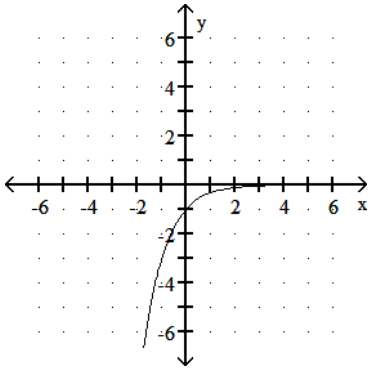
A) No

B) Yes

Graph the exponential function.

42) $y = \left(\frac{1}{3}\right)^x$ 42) _____

A)



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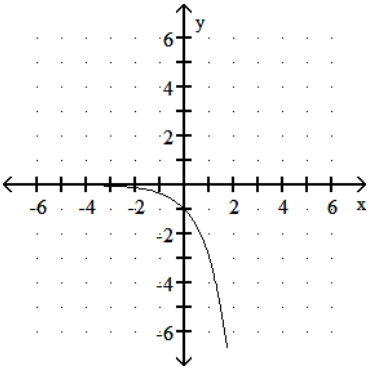

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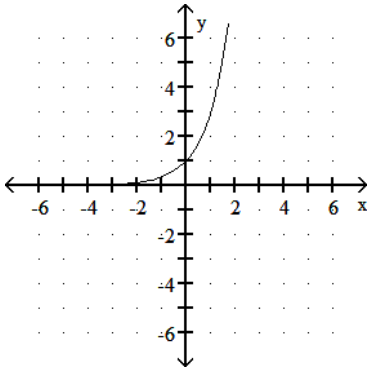
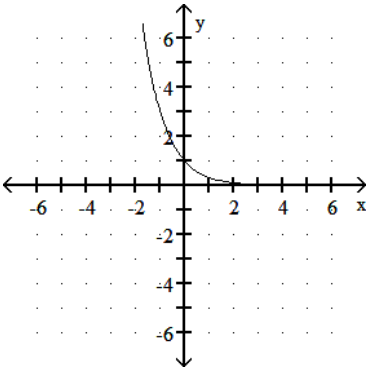


D)



Use common or natural logarithms to solve the exponential equation symbolically.

43) $2^{(7 + 3x)} = \frac{1}{4}$ 43) _____

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

Compute the average rate of change of f from x_1 to x_2. Round your answer to two decimal places when appropriate. Interpret your result graphically.

44) $f(x) = x^3 - 5x$, $x_1 = 2$ and $x_2 = 4$ 44) _____

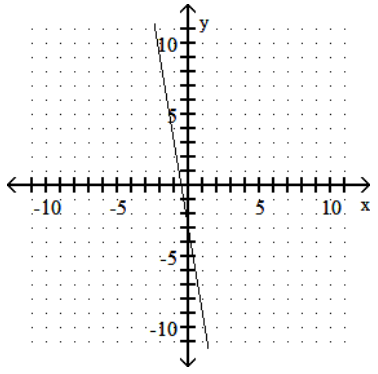
A) -23; the slope of the line passing through (2, f(2)) and (4, f(4)) is -23.
B) -7; the slope of the line passing through (2, f(2)) and (4, f(4)) is -7.
C) 23; the slope of the line passing through (2, f(2)) and (4, f(4)) is 23.
D) 7; the slope of the line passing through (2, f(2)) and (4, f(4)) is 7.

If possible, find the matrix product of AB.

45) $A = \begin{bmatrix} -1 & 3 \\ 4 & 2 \end{bmatrix}$; $B = \begin{bmatrix} -2 & 0 \\ -1 & 3 \end{bmatrix}$ 45) _____

A) $AB = \begin{bmatrix} 9 & -1 \\ 6 & -10 \end{bmatrix}$ B) $AB = \begin{bmatrix} 2 & -6 \\ -3 & 3 \end{bmatrix}$ C) $AB = \begin{bmatrix} 2 & 0 \\ -4 & 6 \end{bmatrix}$ D) $AB = \begin{bmatrix} -1 & 9 \\ -10 & 6 \end{bmatrix}$

Use the graph to determine whether the function is one-to-one.

46) 

46) _____

A) No B) Yes

Find an equation that shifts the graph of f by the indicated amounts.

47) $f(x) = x^4$; right 2 units, up 2 units 47) _____

A) $y = -(x - 2)^4 + 4$ B) $y = (x - 2)^4 + 2$

C) $y = (x + 2)^4 - 2$ D) $y = -(x - 2)^4 + 2$

Use the discriminant to determine the number of real solutions.

48) $w^2 - 2w + 2 = 0$ 48) _____

A) Two real solutions B) No real solutions C) One real solution

Write the system of linear equations that the augmented matrix represents.

49) 49) _____

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 3 \end{array}\right]$$

A) x = -1, y = -1, z = -3 B) x = 0, y = 2, z = 4 C) x = -2, y = -2, z = 0 D) x = 1, y = 1, z = 3

Find a symbolic representation for $f^{-1}(x)$.

50) $f(x) = \sqrt{x - 9}$ 50) _____

A) $f^{-1}(x) = x^2 + 9, x \geq 0$ B) Not a one-to-one function

C) $f^{-1}(x) = (x - 9)^2$ D) $f^{-1}(x) = \sqrt{x + 9}$

Find an equation that shifts the graph of f by the indicated amounts.

51) $f(x) = x^2 + 2x - 7$; left 2 units, down 18 units 51) _____

A) $y = (x + 2)^2 + 2(x + 2) - 25$ B) $y = (x + 2)^2 + 2(x - 2) - 25$

C) $y = (x - 2)^2 + 2(x + 2) + 25$ D) $y = (x - 2)^2 + 2(x - 2) + 25$

Find the median of the set of data.

52) 3, 3, 17, 23, 42, 45, 48 52) _____

A) 42 B) 23 C) 17 D) 26

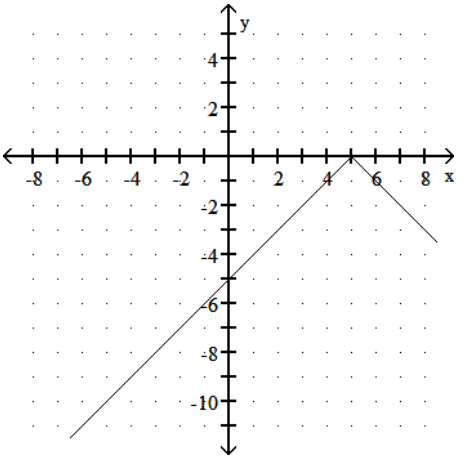
Answer the question.

53) In the "Big Bucks" lottery game, a person is to pick 4 digits from 0 to 9 in correct order. If a number can be repeated, how many ways are there to play the game? 53) _____

A) 262,144 B) 100,000 C) 1,048,576 D) 10,000

Use the graph of f to determine the intervals where f is increasing and where f is decreasing.

54) 54) _____



A) increasing: (-∞ , 0); decreasing (0, ∞) B) increasing: (-∞ , 5); decreasing (5, ∞)

C) increasing: (5, ∞); decreasing (-∞ , 5) D) increasing: (-∞ , ∞); decreasing: never

Solve the system of linear equations.

55) $7x + 8y = -40$ 55) _____

$5x + 2y = -10$

A) (0, -5) B) (-1, -4) C) No solutions D) (0, -4)

Use the discriminant to determine the number of real solutions.

56) $(-3x - 5)^2 = -3$ 56) _____

A) One real solution B) No real solutions C) Two real solutions

Solve the problem.

57) Determine whether the ordered triple (7, 2, -5) is a solution of the system of equations. 57) _____

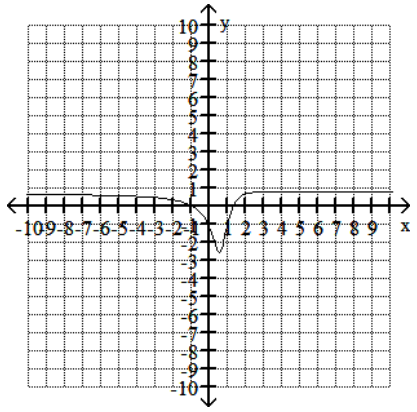
$3x - 8y + z = 0$

$2x + 4y - 3z = 37$

$-x + 2y - z = 2$

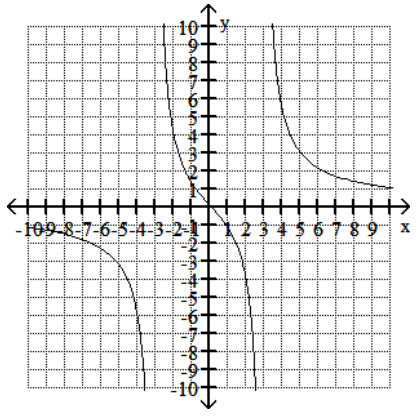
A) Yes B) No

Identify any horizontal asymptotes in the graph.

58) 

58) _____

A) $y = \frac{12}{7}$ B) $y = \frac{5}{7}$ C) $y = 0$ D) None

59) 

59) _____

A) $y = 0$ B) None C) $y = 9$ D) $y = -9$

Find a symbolic representation for $f^{-1}(x)$.

60) $f(x) = (x - 9)^2$ 60) _____

A) $f^{-1}(x) = \sqrt{x} + 9$ B) Not a one-to-one function

C) $f^{-1}(x) = \frac{1}{\sqrt{x + 9}}$ D) $f^{-1}(x) = \sqrt{x + 9}$

If possible, find the matrix product of AB.

61) $A = \begin{bmatrix} 3 & -1 \\ 6 & 0 \end{bmatrix}$; $B = \begin{bmatrix} 0 & -1 \\ 2 & 6 \end{bmatrix}$ 61) _____

A) $AB = \begin{bmatrix} -2 & -9 \\ 0 & -6 \end{bmatrix}$ B) $AB = \begin{bmatrix} -6 & 0 \\ 42 & -2 \end{bmatrix}$ C) $AB = \begin{bmatrix} 0 & 1 \\ 12 & 0 \end{bmatrix}$ D) $AB = \begin{bmatrix} -9 & -2 \\ -6 & 0 \end{bmatrix}$

Specify the domain of the function.

62) $f(x) = \sqrt{10 - x}$ 62) _____

A) All real numbers B) $x > \sqrt{10}$

C) $x \leq 10$ D) $x \neq 10$

Use the discriminant to determine the number of real solutions.

63) $t^2 - 10t + 25 = 0$ 63) _____

A) No real solutions B) One real solution C) Two real solutions

Solve the equation.

64) $|4m + 3| + 8 = 17$ 64) _____

A) 2, - 4 B) $-\frac{3}{2}, 3$ C) $\frac{3}{2}, -3$ D) No solution

Find A^{-1} without a calculator.

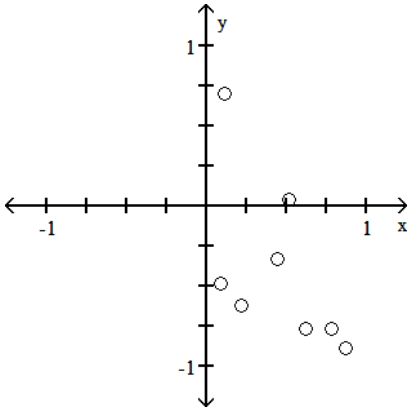
65) $A = \begin{bmatrix} 0 & 2 \\ -4 & 5 \end{bmatrix}$ 65) _____

A) $A^{-1} = \begin{bmatrix} 0 & -\frac{1}{4} \\ \frac{1}{2} & \frac{5}{8} \end{bmatrix}$ B) $A^{-1} = \begin{bmatrix} \frac{5}{8} & \frac{1}{4} \\ -\frac{1}{2} & 0 \end{bmatrix}$ C) $A^{-1} = \begin{bmatrix} \frac{5}{8} & -\frac{1}{4} \\ \frac{1}{2} & 0 \end{bmatrix}$

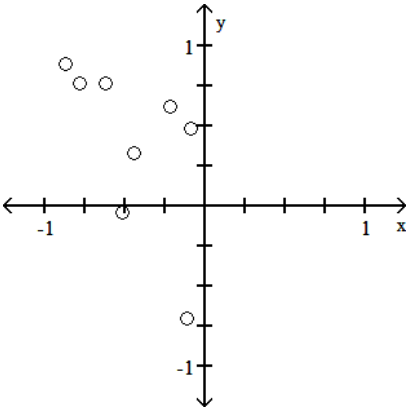
Make a scatterplot of the data.

66) {(0.44, 0.33),(0.87, 0.89),(0.09, 0.48),(0.22, 0.62),(0.11, -0.7), (0.62, 0.77),(0.78, 0.77),(0.52, -0.04)} 66) _____

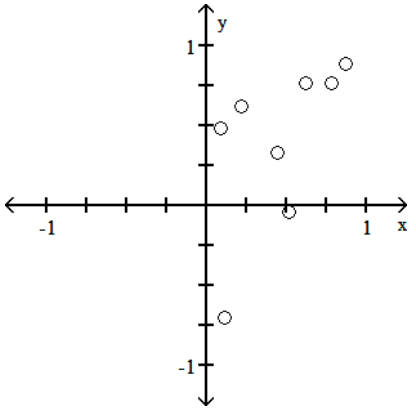
A)



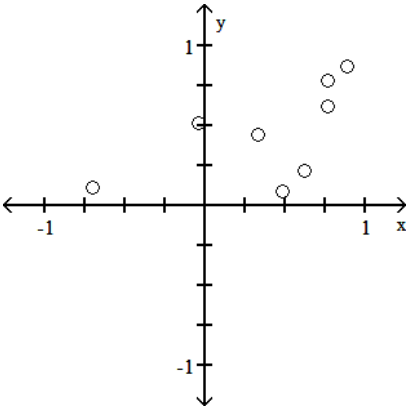
B)



C)



D)



Specify the domain of the function.

67) $f(x) = \frac{\sqrt{x + 5}}{(x + 8)(x - 4)}$ 67) _____

A) $x \geq -5, x \neq -8, x \neq 4$

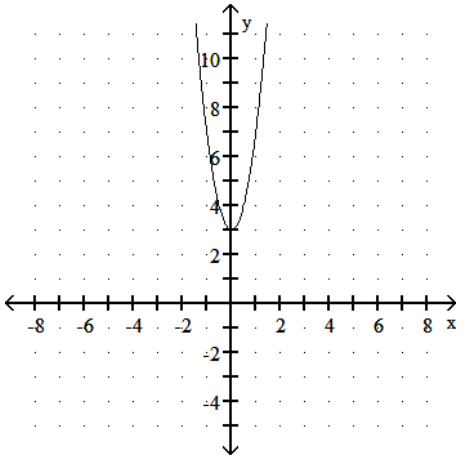
B) $x > 0$

C) All real numbers

D) $x \neq -5, x \neq -8, x \neq 4$

Use the graph of f to determine the intervals where f is increasing and where f is decreasing.

68) 68) _____



A) increasing: $(-\infty, 0)$; decreasing $(0, \infty)$

B) increasing: $(0, \infty)$; decreasing $(-\infty, 0)$

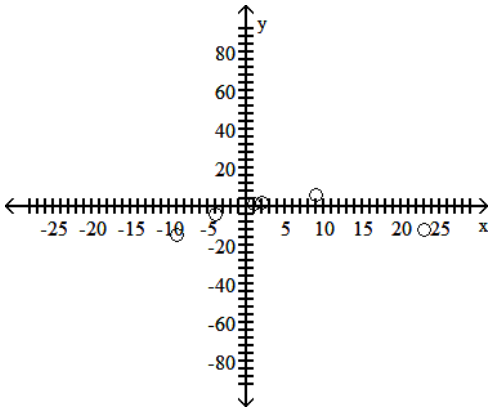
C) increasing: $(-\infty, \infty)$; decreasing: never

D) increasing: never; decreasing: $(-\infty, \infty)$

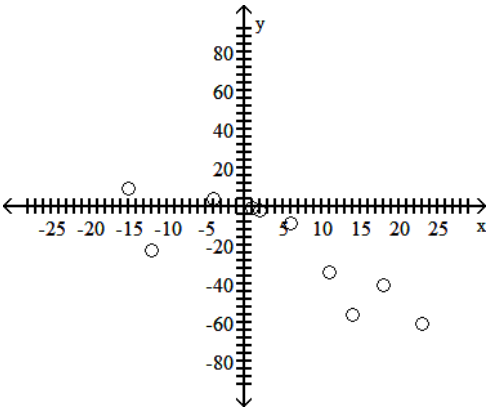
Make a scatterplot of the data.

69) {(14, 56),(-12, 23),(18, 41),(-15, -9),(-4, -4),(11, 34),(6, 9),(23, 61),(2, 2),(1, 1)} 69) _____

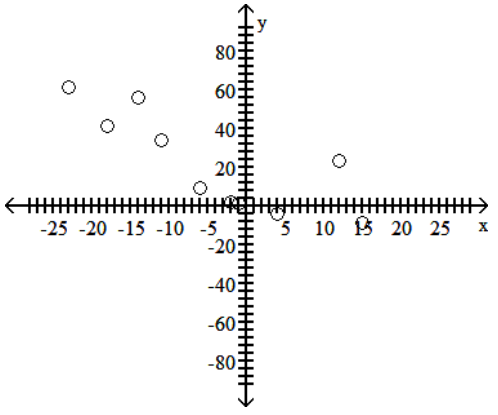
A)



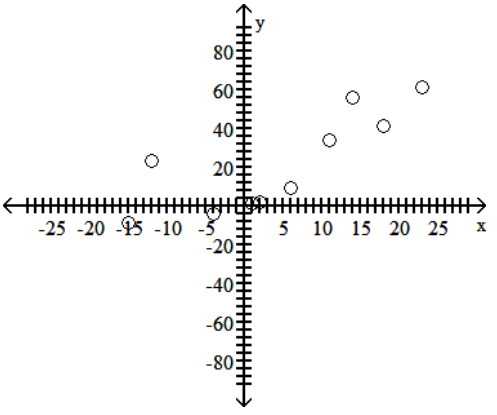
B)



C)



D)



Find A^{-1} without a calculator.

70) $A = \begin{bmatrix} 4 & -3 \\ 0 & 3 \end{bmatrix}$ 70) _____

A) $A^{-1} = \begin{bmatrix} \frac{1}{4} & \frac{1}{4} \\ 0 & \frac{1}{3} \end{bmatrix}$

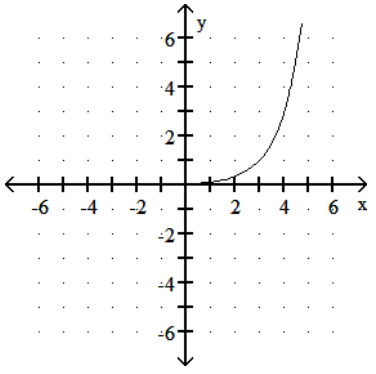
B) $A^{-1} = \begin{bmatrix} 0 & \frac{1}{3} \\ \frac{1}{4} & \frac{1}{4} \end{bmatrix}$

C) $A^{-1} = \begin{bmatrix} \frac{1}{4} & -\frac{1}{4} \\ 0 & \frac{1}{3} \end{bmatrix}$

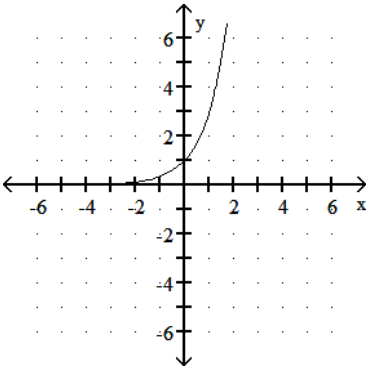
Graph the exponential function.

71) $y = 3^{x-3}$ 71) _____

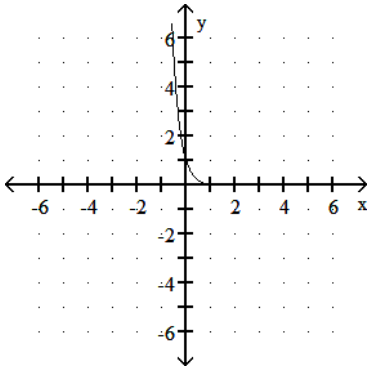
A)



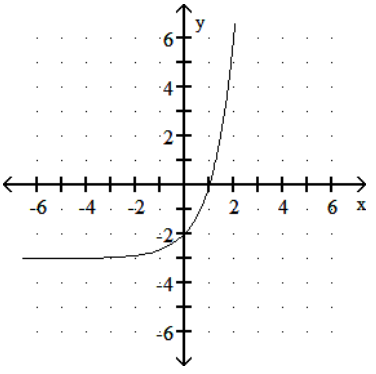
B)



C)



D)



Solve the quadratic equation.

72) $x^2 - 3x - 10 = 0$ 72) _____

A) -4, 10 B) 2, -5 C) 4, -10 D) -2, 5

73) $7x^2 + 10x + 2 = 0$ 73) _____

A) $\frac{-5 \pm \sqrt{39}}{7}$ B) $\frac{-10 \pm \sqrt{11}}{7}$ C) $\frac{-5 \pm \sqrt{11}}{7}$ D) $\frac{-5 \pm \sqrt{11}}{14}$

74) $2x^2 + 8x = -5$ 74) _____

A) $\frac{-4 \pm \sqrt{6}}{4}$ B) $\frac{-4 \pm \sqrt{26}}{2}$ C) $\frac{-4 \pm \sqrt{6}}{2}$ D) $\frac{-8 \pm \sqrt{6}}{2}$

Use common or natural logarithms to solve the exponential equation symbolically.

75) $4^{(1 + 2x)} = 64$ 75) _____

A) $x = \frac{\log 64}{2 \log 4} - \frac{1}{2}$ B) $x = \frac{\log 4}{\log 64} - 2$ C) $x = \frac{\log 64}{\log 4} - 2$ D) $x = 2 + \frac{\log 4}{\log 64}$

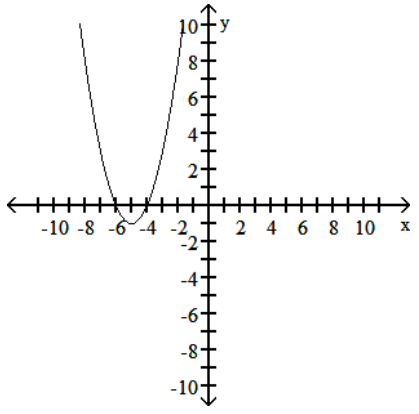
Solve the system of linear equations.

76) $x + 8y = 4$
$-3x + 9y = -12$ 76) _____

A) (5, -1) B) (4, 0) C) (5, 4) D) No solutions

Use the given graph to find the x-intercepts.

77) 77) _____



A) -4, 6 B) -6, 4 C) -4, -6 D) 4, 6

Answer the question.

78) In how many ways can you answer the questions on an exam that consists of 6 true-false questions? 78) _____

A) 144 B) 0 C) 64 D) 184

Solve the inequality symbolically. Express the solution set in interval notation.

79) $4x - 6 \leq 3x - 4$ 79) _____

A) $(4, \infty)$ B) $[2, \infty)$ C) $(-\infty, 4)$ D) $(-\infty, 2]$

Solve the equation.

80) $|k| - 4 = -1$ 80) _____

A) -3 B) -5, 5 C) 3, -3 D) 3

Solve the problem.

81) Determine whether the ordered triple (-3, -1, 4) is a solution of the system of equations. 81) _____

$2x - 2y - 3z = -16$
$4x - 3y + 3z = 3$
$x + y - 5z = -24$

A) No B) Yes

Find the probability of the compound event.

82) Urn A has balls numbered 1 through 8. Urn B has balls numbered 1 through 3. What is the probability that a 4 is drawn from A followed by a 2 from B? 82) _____

A) $\frac{1}{12}$ B) $\frac{11}{24}$ C) $\frac{1}{8}$ D) $\frac{1}{24}$

Determine the equation of the line described. Put the answer in the slope-intercept form, if possible.

83) Through (2, -1), perpendicular to -8x - 7y = -23 83) _____

A) $y = -\frac{2}{7}x - \frac{23}{7}$ B) $y = -\frac{7}{8}x - \frac{11}{4}$ C) $y = \frac{7}{8}x - \frac{11}{4}$ D) $y = \frac{8}{7}x + \frac{8}{7}$

Solve the problem.

84) Let f(x) compute the time in hours to travel x miles at 42 miles per hour. What does $f^{-1}(x)$ compute? 84) _____

A) The miles traveled in x hours
B) The hours taken to travel 42 miles
C) The hours taken to travel x miles
D) The miles traveled in 42 hours

Find the median of the set of data.

85) 63, 77, 212, 254, 423, 497 85) _____

A) 254 B) 233 C) 218.5 D) 212

Solve the logarithmic equation symbolically.

86) log 8x = 8.7 86) _____

A) $x = 10^{8.7/8}$ B) $x = \frac{10^{8.7}}{8}$ C) $x = 10^{0.7}$ D) x = 696

Find the median of the set of data.

87) 78, 15, 219, 163, 297, 245, 244 87) _____

A) 244 B) 219 C) 180 D) 163

Use the compound interest formula to determine the final value of the given amount.

88) $12,000 at 9% compounded quarterly for 7 years 88) _____

A) $21,882.19 B) $22,374.54 C) $21,936.47 D) $10,374.54

89) $1,000 at 5% compounded semiannually for 7 years 89) _____

A) $1378.51 B) $412.97 C) $1412.97 D) $1407.10

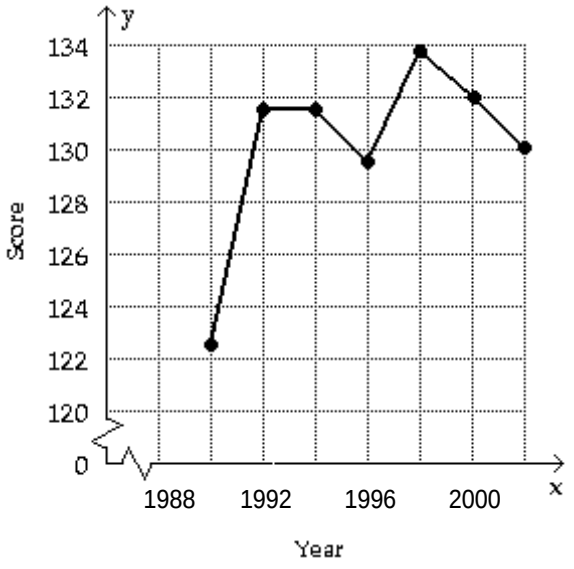
Solve the problem.

90) The table lists the average composite scores on a national entrance exam for selected years. 90) _____

Year	1984	1986	1988	1990	1992	1994	1996
Score	122.7	131.5	131.5	129.5	133.9	132.0	130.0

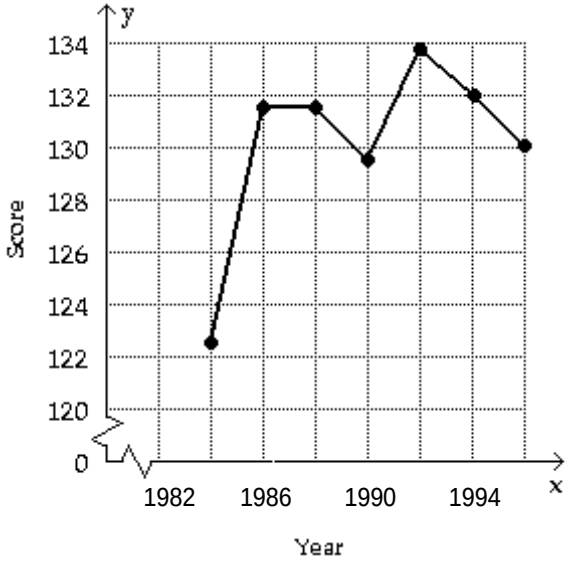
(i) Make a line graph of the data.
(ii) If the graph represents a piecewise-linear function f, find a symbolic representation for the piece f located on the interval [1986, 1988].

A)



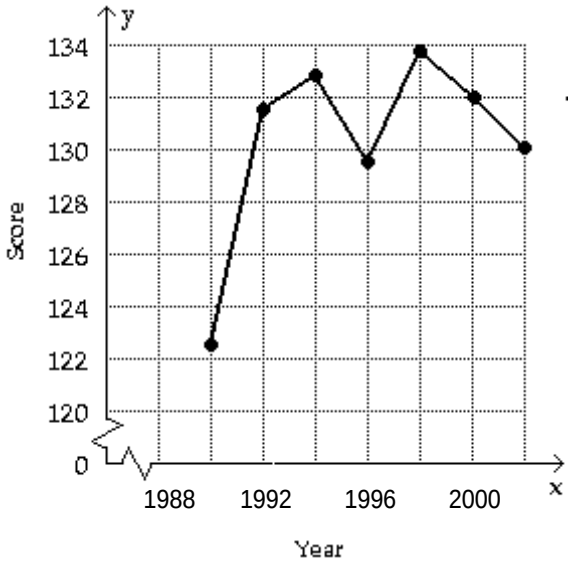
f(x) = 4.4x - 8615.7 if 1990 ≤ x ≤ 1992

B)



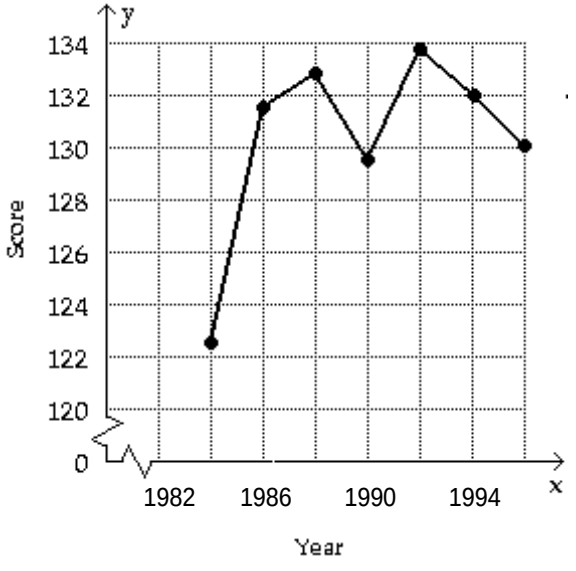
f(x) = 131.5 if 1986 ≤ x ≤ 1988

C)



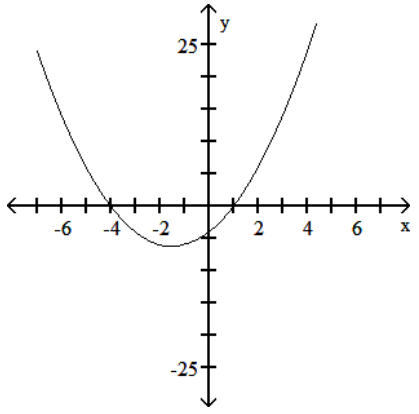
f(x) = 122.7 if 1990 ≤ x ≤ 1992

D)



f(x) = 0.75x - 1359.5 if 1986 ≤ x ≤ 1990

Use the given graph to find the x-intercepts.

91) 

91) _____

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

Approximate f(x) to four decimal places.

92) $f(x) = 3.6e^{-2.1x}$, $x = -1.9$ 92) _____

A) -0.0666 B) -194.5976 C) 0.0666 D) 194.5976

Find a symbolic representation for $f^{-1}(x)$.

93) $f(x) = 7x + 3$ 93) _____

A) $f^{-1}(x) = \frac{x}{7} - 3$ B) $f^{-1}(x) = \frac{x - 3}{7}$

C) $f^{-1}(x) = \frac{x + 3}{7}$ D) Not a one-to-one function

94) $f(x) = x^3 - 3$ 94) _____

A) $f^{-1}(x) = \sqrt[3]{x} + 3$ B) Not a one-to-one function

C) $f^{-1}(x) = \sqrt[3]{x - 3}$ D) $f^{-1}(x) = \sqrt[3]{x + 3}$

Solve the problem.

95) Suppose the amount of a radioactive element remaining in a sample of 100 milligrams after x years can be described by $A(x) = 100e^{-0.01283x}$. How much is remaining after 296 years? Round the answer to the nearest hundredth of a milligram. 95) _____

A) 4459.76 milligrams B) 379.77 milligrams

C) 0.02 milligrams D) 2.24 milligrams

96) The charges for renting a moving van are $55 for the first 20 miles and $9 for each additional mile. Assume that a fraction of a mile is rounded up. (i) Determine the cost of driving the van 85 miles. (ii) Find a symbolic representation for a function f that computes the cost of driving the van x miles, where $0 < x \le 100$. (Hint: express f as a piecewise-constant function.) 96) _____

A) $1000;

$$f(x) = \begin{cases} 55 & \text{if } 0 < x \le 20 \\ 55 + 9(x + 20) & \text{if } 20 < x \le 100 \end{cases}$$

B) $5260;

$$f(x) = \begin{cases} 55x & \text{if } 0 < x \le 20 \\ 55x + 9(x - 20) & \text{if } 20 < x \le 100 \end{cases}$$

C) $640;

$$f(x) = \begin{cases} 55 & \text{if } 0 < x \le 20 \\ 55 + 9(x - 20) & \text{if } 20 < x \le 100 \end{cases}$$

97) In Country X, the average hourly wage in dollars from 1945 to 1995 can be modeled by 97) _____

$$f(x) = \begin{cases} 0.073(x - 1945) + 0.38 & \text{if } 1945 \le x < 1970 \\ 0.187(x - 1970) + 3.08 & \text{if } 1970 \le x \le 1995 \end{cases}$$

Use f to estimate the average hourly wages in 1950, 1970, and 1990.

A) $3.45, $0.38, $6.82 B) $0.75, $2.21, $6.82 C) $0.75, $3.08, $6.82

98) Brand A soup contains 751 milligrams of sodium. Find a linear function f that computes the number of milligrams of sodium in x cans of Brand A soup. 98) _____

A) $f(x) = 751 + x$ B) $f(x) = 751$ C) $f(x) = x - 751$ D) $f(x) = 751x$

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

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