Sullivan 8th Edition
MAC 1105 (Kincade)
Chapter 4 Practice for the Test   (V2)

Name: _____
Date: _____
Section: _____

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

Determine the average rate of change for the function.

1) $f(x) = \dfrac{3}{5}x + 1$

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

1) _____

2) $F(x) = -6$

    A) 0   B) 6   C) $-\dfrac{1}{6}$ D) –6

2) _____

Determine whether the given function is linear or nonlinear. If it is linear, determine the slope.
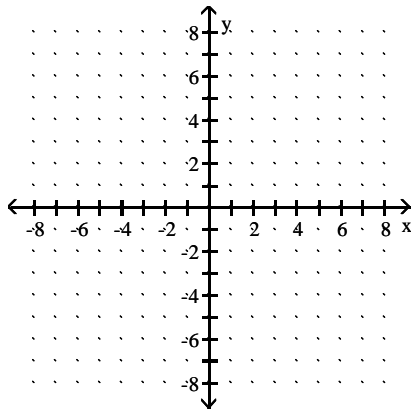
3)

x	y = f(x)
5	10
9	18
13	26
17	34

    A) Linear; 2   B) Nonlinear

3) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
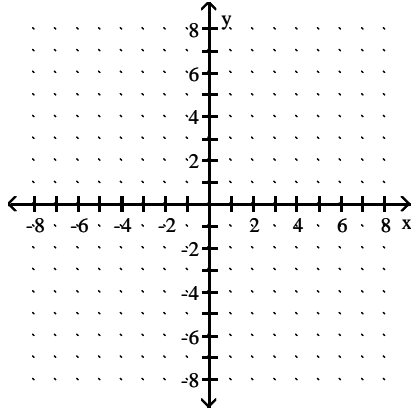
Graph the function. State whether it is increasing, decreasing, or constant..

4) $h(x) = -5x + 6$

4) _____

5) $f(x) = \dfrac{3}{5}x + 1$

5) _____

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

Solve the problem.

6) Suppose that $f(x) = -x - 8$ and $g(x) = x - 15$.

6) _____

    (a) Solve $f(x) = 0$.

    (b) Solve $g(x) = 0$.

    (c) Solve $f(x) = g(x)$.

    A) (a) $x = -8$; (b) $x = 15$; (c) $x = -11.5$ B) (a) $x = -8$; (b) $x = 15$; (c) $x = 3.5$

    C) (a) $x = 8$; (b) $x = 15$; (c) $x = 3.5$ D) (a) $x = -8$; (b) $x = -15$; (c) $x = 3.5$

7) Suppose that $f(x) = -x - 8$ and $g(x) = x - 12$.

7) _____

    (a) Solve $f(x) > 0$.

    (b) Solve $g(x) > 0$.

    (c) Solve $f(x) \le g(x)$.

    A) (a) $x > 8$; (b) $x > 12$; (c) $x > 2$ B) (a) $x < -8$; (b) $x < 12$; (c) $x \ge -10$
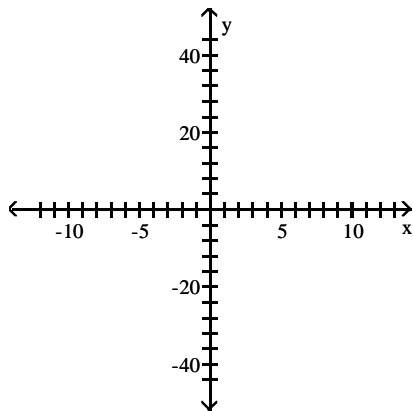
    C) (a) $x < -8$; (b) $x > 12$; (c) $x \ge 2$ D) (a) $x < -8$; (b) $x < -12$; (c) $x \le 2$

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

Graph the function using its vertex, axis of symmetry, and intercepts.
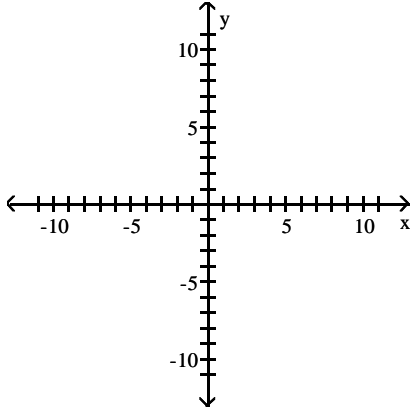
8) $f(x) = x^2 - 10x + 25$

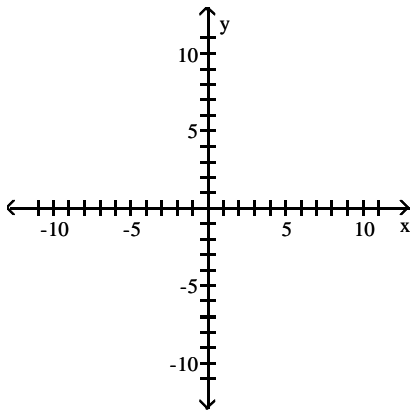8) _____

2

9) $f(x) = -x^2 + 4x + 5$

9) _____

Graph the function f by starting with the graph of $y = x^2$ and using transformations (shifting, compressing, stretching, and/or reflection).
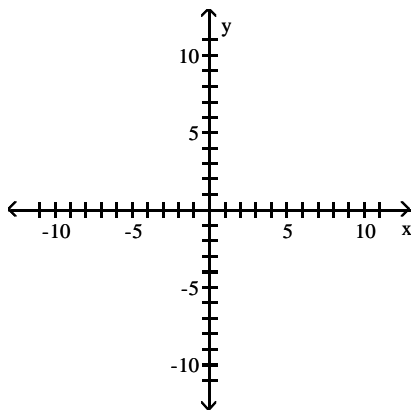
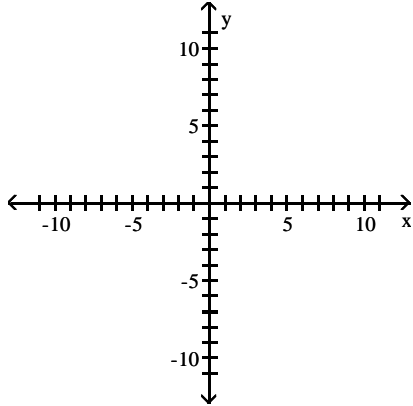10) $f(x) = x^2 + 8x + 7$

10) _____

11) $f(x) = -5x^2 - 3$

11) _____

12) $f(x) = \dfrac{1}{4}x^2 + 3$

12) _____

Find the vertex and axis of symmetry of the graph of the function.

13) $f(x) = -3x^2 + 12x$

13) _____

14) $f(x) = x^2 + 8x$

14) _____

15) $f(x) = -10x^2 - 2x - 3$

15) _____

Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find that value.

16) $f(x) = 3x^2 + 3x - 9$

16) _____
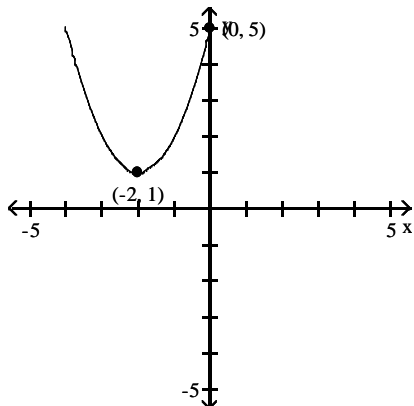
17) $f(x) = -2x^2 + 2x$

17) _____

18) $f(x) = -x^2 - 3x - 9$

18) _____

Determine the quadratic function whose graph is given.

19)

19) _____

4

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

Solve the problem.

20) The owner of a video store has determined that the cost C, in dollars, of operating the store is approximately given by $C(x) = 2x^2 - 32x + 600$, where x is the number of videos rented daily. Find the lowest cost to the nearest dollar.

    A) $344   B) $728   C) $472   D) $88

20) _____

21) Alan is building a garden shaped like a rectangle with a semicircle attached to one short side. If he has 20 feet of fencing to go around it, what dimensions will give him the maximum area in the garden?

    A) width $= \dfrac{40}{\pi + 8} \approx 3.6$, length $= 5.4$

    B) width $= \dfrac{40}{\pi + 4} \approx 5.6$, length $= 2.8$

    C) width $= \dfrac{40}{\pi + 4} \approx 5.6$, length $= 7.2$

    D) width $= \dfrac{20}{\pi + 4} \approx 2.8$, length $= 5.6$

21) _____

22) The manufacturer of a CD player has found that the revenue R (in dollars) is $R(p) = -5p^2 + 1120p$, when the unit price is p dollars. If the manufacturer sets the price p to maximize revenue, what is the maximum revenue to the nearest whole dollar?

    A) $250,880   B) $125,440   C) $62,720   D) $501,760

22) _____

23) The profit that the vendor makes per day by selling x pretzels is given by the function $P(x) = -0.004x^2 + 2.8x - 250$. Find the number of pretzels that must be sold to maximize profit.

    A) 240 pretzels   B) 1.4 pretzels   C) 350 pretzels   D) 700 pretzels

23) _____

24) Consider the quadratic model $h(t) = -16t^2 + 40t + 50$ for the height (in feet), h, of an object t seconds after the object has been projected straight up into the air. Find the maximum height attained by the object. How much time does it take to fall back to the ground? Assume that it takes the same time for going up and coming down.

    A) maximum height = 75 ft; time to reach ground = 2.5 seconds
    B) maximum height = 50 ft; time to reach ground = 1.25 seconds
    C) maximum height = 75 ft; time to reach ground = 1.25 seconds
    D) maximum height = 50 ft; time to reach ground = 2.5 seconds

24) _____

25) A business purchasing an item for business purposes may use straight–line depreciation to obtain a tax deduction. The formula for the present value, P, after t years is $P = C - \left(\dfrac{C - s}{L}\right) t$, where C is the cost and s is the scrap value after L years. The number L is called the useful life of the item. If a certain piece of equipment costs $20,000 and has a scrap value of $5000 after 6 years, find the present value of the equipment after 7 years.

    A) $17,500   B) $7142.86   C) $14,133.67   D) $2500

25) _____

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

26) Each month a beauty salon gives x manicures for $12.00/manicure. The cost to the owner of the beauty salon for each manicure is $7.35. The monthly fixed cost to maintain a manicure station is $120.00. Write an equation that relates the monthly profit, in dollars, to the number of manicures given each month. Then use the equation to find the monthly profit when 200 manicures are given in a month.

26) _____

Determine if the type of relation is linear, nonlinear, or none.

27)
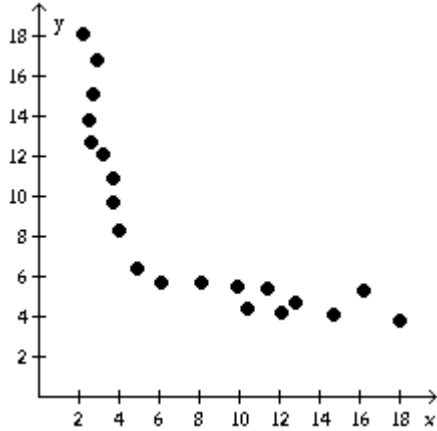
Use a graphing calculator to plot the data and find the quadratic function of best fit.

28) The number of housing starts in one beachside community remained fairly level until 1992 and then began to increase. The following data shows the number of housing starts since 1992 (x = 1). Use a graphing calculator to plot a scatter diagram. What is the quadratic function of best fit?

28) _____

Year, x	Housing Starts, H
1	200
2	205
3	210
4	240
5	245
6	230
7	220
8	210

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

Solve the problem.

29) Linda needs to have her car towed. Little Town Auto charges a flat fee of $70 plus $3 per mile towed. Write a function expressing Linda's towing cost, c, in terms of miles towed, x. Find the cost of having a car towed 12 miles.

29) _____

A) c(x) = 3x + 70; $96
B) c(x) = 3x; $36
C) c(x) = 3x + 70; $106
D) c(x) = 3x; $73

30) 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.

30) _____

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

6

31) Suppose that the quantity supplied S and quantity demanded D of baseball caps at a major league game are given by the functions S(p) = 4830 – 80p and D(p) = 130p, where p is the price. Find the equilibrium price for caps at the game. Then find the equilibrium quantity.

31) _____

   A) $37, $1870   B) $50, $2990   C) $23, $2990   D) $50, $830

32) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.30 as soon as you get in the taxi, to which a charge of $2.35 per mile is added. Find an equation that can be used to determine the cost, C(x), of an x–mile taxi ride.

32) _____

   A) $C(x) = 4.65x$ B) $C(x) = 2.30 + 2.35x$
   C) $C(x) = 2.35 + 2.30x$ D) $C(x) = 3.15x$

33) A lumber yard has fixed costs of $5048.40 per day and variable costs of $0.71 per board–foot produced. Lumber sells for $2.11 per board–foot. How many board–feet must be produced and sold daily to break even?

33) _____

   A) 7110 board–feet   B) 1790 board–feet
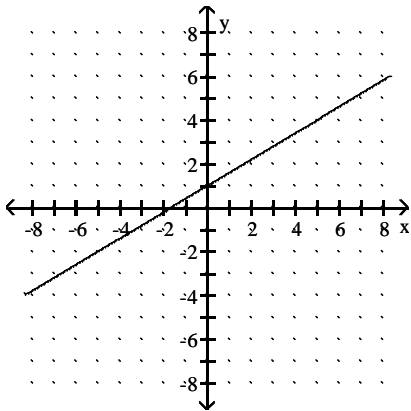   C) 3606 board–feet   D) 2404 board–feet

1) A
2) A
3) A
4) decreasing
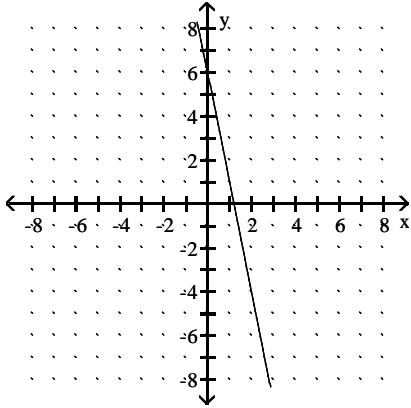
5) increasing

6) B
7) C
8) vertex (5, 0)
   intercepts (0, 25), (5, 0)
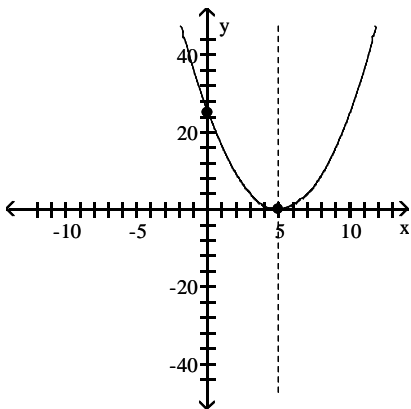
9) vertex (2, 9)
intercepts (5, 0), (– 1, 0), (0, 5)

10)

11)
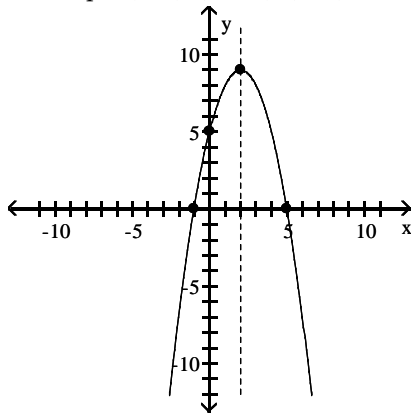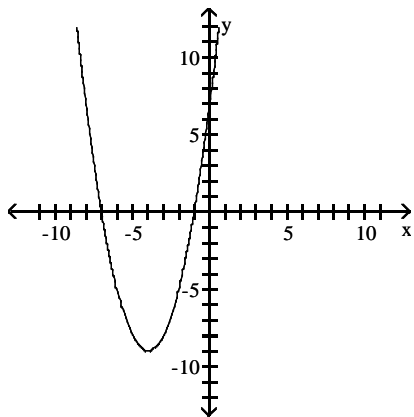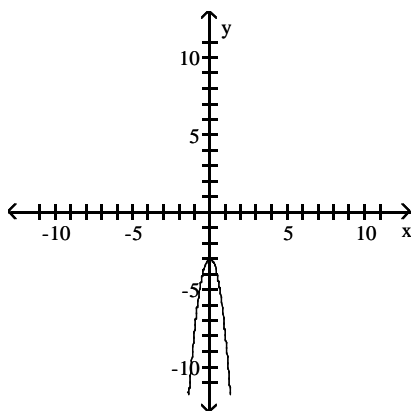
12)
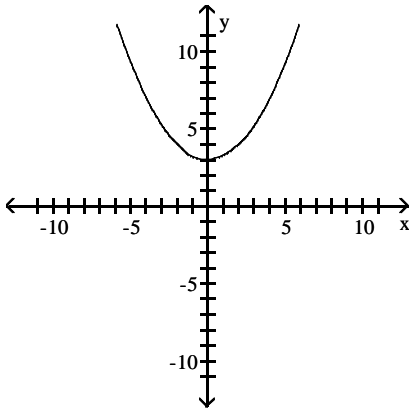
13) (2, 12); x = 2

14) (−4, −16); x = −4

15) $\left(-\dfrac{1}{10}, -\dfrac{29}{10}\right)$; $x = -\dfrac{1}{10}$

16) minimum; $-\dfrac{39}{4}$

17) maximum; $\dfrac{1}{2}$

18) maximum; $-\dfrac{27}{4}$

19) $f(x) = x^2 + 4x + 5$

20) C

21) B

22) C

23) C

24) A

25) D

26) P = 4.65x − 120; $810

27) nonlinear

28) $H(x) = -2.679x^2 + 26.607x + 168.571$

29) C

30) D

31) C

32) B

33) C