1) Find the slope of the line passing through the two points.
   (–3, –4) and (–5, 6)
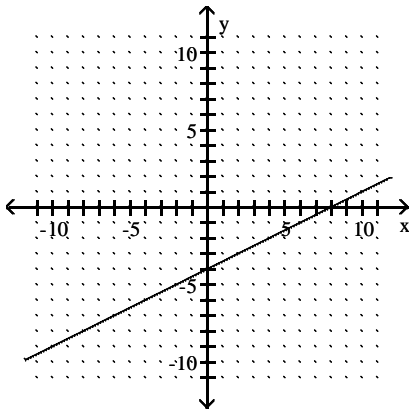   A) 10   B) 5   C) –5   D) 2
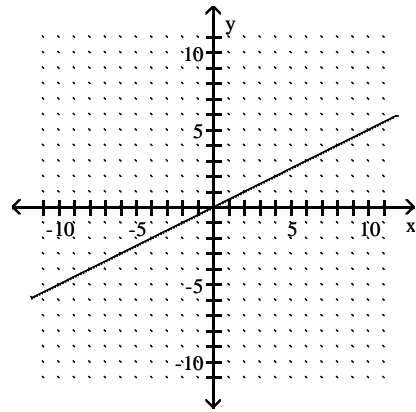
2) Sketch the line with slope $\frac{3}{2}$ that passes through the point (4, 2)
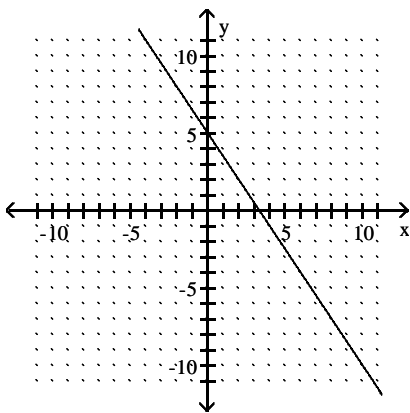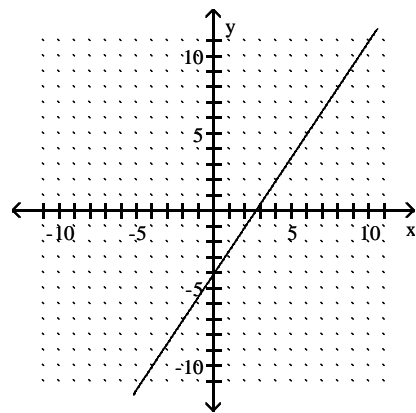
A)

B)

C)

D)

3) Find the equation of the line with slope –2, passing through (6, 2)
      A) $y = -2x - 10$ B) $y = -2x + 8$ C) $y = 2x - 4$ D) $y = -2x + 14$

4) Find an equation of the line through (2, –5) and (5, –23)
      A) $y = -6x + 7$ B) $y = -6x - 5$ C) $y = -\frac{1}{6}x - \frac{14}{3}$ D) $y = 6x - 17$

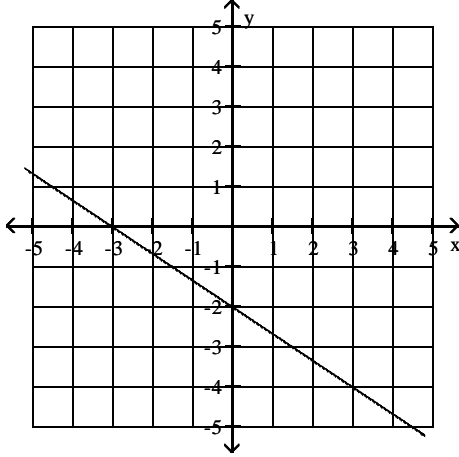5) Find the equation of the line perpendicular to $y = \frac{2}{5}x + 2$, passing through (8, –6)

      A) $y = -\frac{2}{5}x + 16$ B) $y = \frac{5}{2}x - 14$ C) $y = -10x + 19$ D) $y = -\frac{5}{2}x + 14$

6) **Wrtie an equation in slope–intercept form for the line shown.**

A) $y = -\dfrac{3}{2}x - 3$

B) $y = -\dfrac{3}{2}x - 2$

C) $y = -\dfrac{2}{3}x - 2$

D) $y = \dfrac{2}{3}x - 2$

7) The number of televisions in the average American home x years after 1994 is given by $N(x) = .05x + 1.4$. Evaluate $N(8)$ and interpret the result.
   A) $N(8) = 2.1$; there were an average of 2.1 televisions per home in 2002.
   B) $N(8) = 1.8$; there were an average of 1.8 televisions per home in 2002.
   C) $N(8) = 1.8$; there were an average of 1.8 more televisions per home in 2002 than in 1994.
   D) $N(8) = 1.5$; there were an average of 1.5 televisions per home in 2002.

8) The population of Midville, in thousands of people, is given by $P(t) = 1.5t + 3$, where t is the number of years after 1980. Choose the correct statement.
   A) In 1986, the population was 9,000. B) In 1986, the population was 12,000.
   C) In 1980, the population was 4500. D) In 1992, the population was 6000.

9) The charge for renting a car is $26 per day and initial fee of $15. Write a formula for the cost of renting a car for x days.
   A) $y = x + 15$ B) $y = x + 26$ C) $y = 15x + 26$ D) $y = 26x + 15$

10) The value, in dollars, of a copy machine is given by the function $f(x) = -250x + 5000$, where x is the number of years that have passed since the machine was purchased. Interpret the **slope** of the graph of f as a rate of change.
   A) The copy machine decreases in value by $250 each year.
   B) The copy machine was worth $5000 initially
   C) The copy machine depreciates entirely in 20 years.
   D) The copy machine decreases in value by $20 each year.

11) Francine received 120 hours of free Internet time in a promotional offer. She spends 1.5 hours per day connected to the Internet. H = f(t) gives the number of free hours Francine has left after t days. What does the t–intercept of the graph tell us?

    A) Francine had 120 free hours initially.

    B) She will use up the free hours in 80 days.

    C) How long Francine spends on the Internet every day.

    D) The number of days that have gone by

12) A person is driving a car along a straight road. The graph shows the distance y in miles that the driver is from home after x hours.
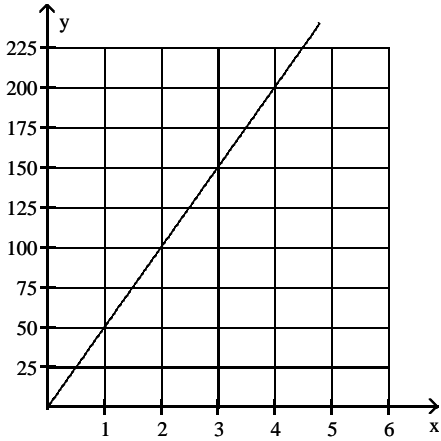
The graph passes through the point (2, 100). What is the meaning of this point?

    A) It will take the driver 2 hours to complete the trip, which requires driving 100 additional miles.

    B) The driver has driven for 2 hours and must drive an additional 100 miles to complete the trip.

    C) After 2 hours the driver is 100 miles from home.

    D) After 100 hours, the driver is 2 miles from home.

13) The graph shows the number of gallons of water in a swimming pool after x hours. There is a pump that can either add or remove water from the pool. Find the slope of the line, and interpret the slope as a rate of change.
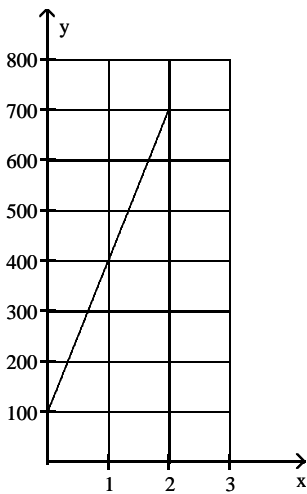
    A) The pump adds water at a rate of 100 gallons per hour for two hours.

    B) The pump adds 600 gallons of water.

    C) The pump adds water for two hours until there are 700 gallons of water in the pool.

    D) The pump adds water at a rate of 300 gallons per hour for two hours.

Solve the equation.

14) $7x + 4x + 7 = -9x$

    A) $-\dfrac{7}{20}$ B) $\dfrac{7}{20}$ C) $\dfrac{7}{2}$ D) $\dfrac{20}{7}$

15) $-3(k + 2) - (-4k - 4) = 5$

    A) 3   B) 7   C) -7 D) 1

16) **Decide if the given value for the variable is a solution to the inequality (Y/N).**

    $3z - 7 < 6z - (4z + 5); \quad z = 1$

    A) Yes   B) No

17) **Solve the inequality:** $20x - 36 > 4(4x - 8)$

    A) $x < 1$ B) $x > 1$ C) $x > 20$ D) $x < 20$

18) **Solve for x:** $|5x + 4| + 10 = 8$

    A) $-\dfrac{2}{5}, -\dfrac{6}{5}$ B) $-\dfrac{1}{2}, -\dfrac{3}{2}$ C) $\dfrac{2}{5}, \dfrac{6}{5}$ D) No solution

19) **What is the x–value of the solution to the system?**

    $-7x + 5y = 5$
    $5x + 3y = 3$

    A) x=2   B) x=−1   C) x=0   D) No solutions

20) **What is the x–value of the solution to the system?**

    $x - y + 5z = -4$
    $2x \quad + z = 0$
    $x + 5y + z = 20$

    A) x=1   B) x=0   C) x=4   D) No solution

21) **What is the x–value of the solution to the system?**

    $x + y + z = -1$
    $x - y + 4z = -11$
    $4x + y + z = 11$

    A) x=−1   B) x=−4   C) x=4   D) No solution

22) When 75% of a number is added to 6, the result is 3 more than the number. Write the equation that models this problem.

    A) $0.75x + 6 = x + 3$ B) $0.75 + 6 = x + 3$ C) $0.75 + x + 6 = x + 3$ D) $0.75x = 6 + 3x$

Write a system of linear equations that models the situation.

23) 6 boxes of chocolate–covered almonds and 5 soft drinks cost $28, 7 boxes of chocolate–covered almonds and 3 soft drinks cost $27. Let x be the price of a box of chocolate–covered almonds and y be the price of a soft drink.

    A) $5x + 6y = 28$ B) $6x + 3y = 28$ C) $6x + 5y = 28$ D) $6x + 7y = 28$
           $7x + 3y = 27$ $5x + 7y = 27$ $7x + 3y = 27$ $5x + 3y = 27$

24) There were 510 people at a play. The admission price was $3 for adults and $1 for children. The admission receipts were $1210. Let x be the number of adults that attended the play and y be th number of children who attended the play.

A) $y = 510 - x$
   $x + y = 1210$

B) $1210 - y = 510$
   $3x = 1210$

C) $x + y = 1210$
   $3x + y = 510$

D) $x + y = 510$
   $3x + y = 1210$

25) A certain aircraft can fly 1280 miles with the wind in 5 hours and travel the same distance against the wind in 8 hours. Let x be the speed of the plane in still air and y be the speed of the wind.

A) $5x = 1280$
   $8x = 1280$

B) $x + y = 1280$
   $8x = 5y$

C) $5x + 5y = 1280$
   $8x - 8y = 1280$

D) $5x + 8y = 1280$
   $5x = 8y$

Solve.

26) How much pure acid (100% acid solution) should be mixed with 6 gallons of a 50% acid solution in order to get an 80% acid solution?

A) 15 gal   B) 24 gal   C) 9 gal   D) 3 gal

27) Linda and Dave leave simultaneously from the same starting point biking in opposite directions. Linda bikes at 6 miles per hour and Dave bikes at 9 miles per hour. How long will it be until they are 25 miles apart from each other?

A) $\dfrac{25}{54}$ hrs   B) $1\dfrac{2}{3}$ hrs   C) $\dfrac{3}{5}$ hrs   D) $8\dfrac{1}{3}$ hrs

28) **Solve the equation:** $11m^2 - 14m = 0$

A) $-\dfrac{14}{11}, \dfrac{14}{11}$ B) $0, \dfrac{14}{11}$ C) 0 D) $-\dfrac{14}{11}, 0$

29) Which of the following is a step in the solution of $x^2 - 12x - 8 = 0$ by completing the square?

A) $3x^2 - 12x + 36 = -8 + 36$ B) $(x - 6)^2 = 8 + 36$
C) $(x - 6)^2 = 8$ D) $(x - 2)^2 = 8 + 12$

30) Which of the following is a step in the solution of $3x^2 - 12x - 8 = 0$ by completing the square?

A) $3x^2 - 12x + 36 = 8 + 36$ B) $3(x - 2)^2 = 8 + 4$
C) $(3x - 6)^2 = 8 + 36$ D) $3(x - 2)^2 = 8 + 12$

31) Solve for r: $A = P(1 + r)^2$

A) $r = \dfrac{\pm\sqrt{A} - 1}{P}$ B) $r = \pm\sqrt{\dfrac{A}{P}} - 1$ C) $r = \dfrac{\pm\sqrt{A}}{P} - 1$ D) $r = \pm\sqrt{A - P} - 1$

32) **Use the quadratic formula to solve the equation.**

$2x^2 + 8x + 3 = 0$

A) $\dfrac{-4 - \sqrt{10}}{2}, \dfrac{-4 + \sqrt{10}}{2}$

B) $\dfrac{-8 - \sqrt{10}}{2}, \dfrac{-8 + \sqrt{10}}{2}$

C) $\dfrac{-4 - \sqrt{10}}{4}, \dfrac{-4 + \sqrt{10}}{4}$

D) $\dfrac{-4 - \sqrt{22}}{2}, \dfrac{-4 + \sqrt{22}}{2}$

33) A window washer accidentally drops a bucket from the top of a 256–foot building. The height h of the bucket after t seconds is given by $h = -16t^2 + 256$. When will the bucket hit the ground?

    A) 16 sec   B) 64 sec   C) 4 sec   D) –4 sec

34) **Find the vertex of the parabola.**

$f(x) = x^2 - 10x + 32$

    A) (5, 32)   B) (0, 32)   C) (5, 7)   D) (0, 7)

35) Find an equation for the parabola with vertex (–3, –5) and intercept (0, 13).

    A) $y = 2x^2 + 12x + 13$ B) $y = -3x^2 - 5x + 13$ C) $y = x^2 - 3x + 13$ D) $y = (x+3)^2 - 5$

36) A hotel finds that its revenue is given by $R = (80 + 10x)(100 - 3x)$ when it charges $80 + 10x$ dollars for a room. To the nearest dollar, what is the maximum revenue it can earn?
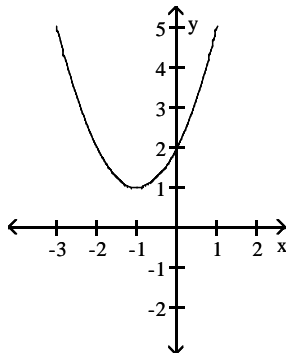
    A) $9,920   B) $13,530   C) $12,813   D) no maximum
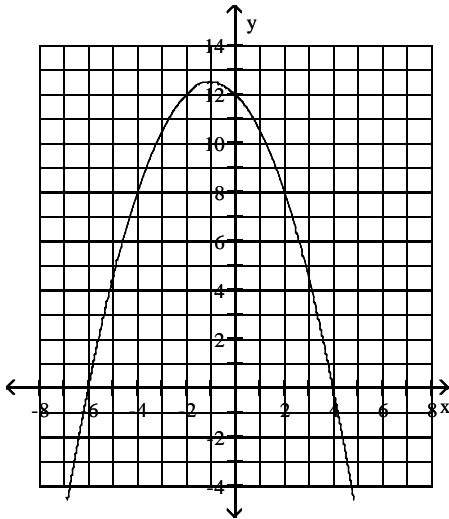
37) Find the equation for the parabola in the graph:

    A) $y = (x - 1)^2$ B) $y = (x-1)^2 + 1$ C) $y = (x+1)^2 + 1$ D) $y = (x+1)^2 - 1$

38) Find an equation for the parabola:

A) $y = -x^2 + 2x + 12$

B) $y = -0.5x^2 - x + 12$

C) $y = -0.5x^2 + x + 12$

D) $y = x^2 + 2x + 12$

39) **Solve the inequality**: $x^2 - 4x > 0$

A) $x > 4$

B) $x > 0$ or $x > 4$

C) $x < -4$ or $x > 4$

D) $x < 0$ or $x > 4$

40) **Solve:** $|2x - 8| < 5$

A) $\dfrac{3}{2} < x < \dfrac{13}{2}$

B) $x < -\dfrac{13}{2}$ or $x > \dfrac{13}{2}$

C) $x < \dfrac{13}{2}$

D) $x < \dfrac{13}{2}$ or $x < \dfrac{3}{2}$

41) **Factor**: $x^3 - 8y^6$

A) $\left(x - 2y^2\right)^3$

B) $\left(x - y\right)\left(x^2 + 8y^5\right)$

C) $\left(x - 2y^2\right)\left(x^2 + 4y^4\right)$

D) $\left(x - 2y^2\right)\left(x^2 + 2xy^2 + 4y^4\right)$

42) **Multiply:** $\dfrac{k^2 + 11k + 18}{k^2 + 13k + 36} \cdot \dfrac{k^2 + 4k}{k^2 + 9k + 14}$

A) $\dfrac{k}{k + 7}$

B) $\dfrac{1}{k + 7}$

C) $\dfrac{k}{k^2 + 13k + 36}$

D) $\dfrac{k^2 + 4k}{k + 7}$

43) **Divide:** $\dfrac{36x^2 - 25}{x^2 - 64} \div \dfrac{6x - 5}{x + 8}$

A) $\dfrac{6x + 5}{x - 8}$

B) $\dfrac{x - 8}{6x + 5}$

C) $\dfrac{(6x - 5)(36x^2 - 25)}{(x^2 + 8)(x + 8)}$

D) $\dfrac{6x - 5}{x + 8}$

44) **Add. Simplify if possible.**

$$\frac{15}{x^2 + 3x} + \frac{4}{x} + \frac{5}{x + 3}$$

A) $\dfrac{4}{x}$ B) $\dfrac{9}{x}$ C) $\dfrac{5}{x}$ D) $\dfrac{20}{x}$

45) **Subtract. Simplify if possible.**

$$\frac{7}{z^2} - \frac{2}{z}$$

A) $\dfrac{2z - 7}{z}$ B) $\dfrac{7 - 2z}{z^2}$ C) $\dfrac{7z + 2}{z^2}$ D) $\dfrac{7 + 2z}{z^2}$

46) **Solve:** $\dfrac{5}{x + 5} - \dfrac{7}{x - 5} = \dfrac{12}{x^2 - 25}$

A) $x = 4\sqrt{3}$ B) $x = 72$ C) $x = -36$ D) $x = 36$

47) **Simplify:** $\dfrac{\dfrac{5}{x} + 3}{\dfrac{25}{x^2} - 9}$

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

48) y is directly proportional to x and y = 36 when x = 6. Find the constant of proportionality k.
   Then, find y when x = 13.

A) k = – 6; y = – 78   B) k = 216; y = $\dfrac{216}{13}$ C) k = 8; y = 104   D) k = 6; y = 78

49) y is inversely proportional to x and y = 22.5 when x = 9. Find the constant of proportionality k.
   Then, find y when x = 81.
   A) k = 202.5; y = 2.5   B) k = 226.8; y = 2.8   C) k = 2.5; y = 202.5   D) k = 178.2; y = 2.2

50) The amount of force F in pounds needed to lift a heavy object with a lever varies inversely with the length L of
   the lever. It took 100 pounds of force to lift a refrigerator with a 12–foot lever. Which equation models F as a
   function of L?

A) F = 8.5L   B) F = 1200L   C) F = $\dfrac{8.5}{L}$ D) F = $\dfrac{1200}{L}$

51) Simplify and write answer with positive exponents: $\dfrac{(2a^{-3})^{-4}}{2a^{-4}}$

A) $\dfrac{-8}{a^{16}}$ B) $\dfrac{a^8}{8}$ C) $\dfrac{a^{16}}{32}$ D) $\dfrac{-4}{a^8}$

52) **Simplify the expression. Write with positive exponents.**

$$\frac{(2x^{3/2})^2}{x^{1/2}}$$

    A) $4x^{5/2}$ B) $2x^3$ C) $4x^2$ D) $4x^{7/4}$

53) **Multiply:** $x^{\frac{1}{4}}\left(2x - x^{\frac{1}{4}}\right)$

    A) $2x^{\frac{1}{2}} - x^{\frac{1}{8}}$ B) $2x$ C) $\frac{1}{2}x - \frac{1}{4}x^2$ D) $2x^{\frac{5}{4}} - x^{\frac{1}{2}}$

Simplify the expression. Assume that all variables are positive.

54) $\sqrt[3]{x^{18}y^3}$

    A) x^6y^2 B) x^6y C) x^2y^6 D) xy^6

55) $\sqrt{45x^7y^8}$

    A) $3x^3y^4\sqrt{5}$ B) $3y^4\sqrt{5x^7}$ C) $3x^7y^8\sqrt{5x}$ D) $3x^3y^4\sqrt{5x}$

Rationalize the denominator.

56) $\frac{7a}{\sqrt{6}}$

    A) 43 B) $\frac{49a\sqrt{6}}{6}$ C) $7a\sqrt{6}$ D) $\frac{7a\sqrt{6}}{6}$

57) $\frac{5}{7-\sqrt{5}}$

    A) $\frac{35+5\sqrt{5}}{2}$ B) $\frac{35-5\sqrt{5}}{44}$ C) $\frac{35+5\sqrt{5}}{44}$ D) $\frac{5}{7}-\frac{5}{\sqrt{5}}$

58) **Solve the equation.** $\sqrt{x+4} = \sqrt{x}+1$

    A) $1 < x < 2$ B) $2 < x < 3$ C) $3 < x < 4$ D) $4 < x < 5$

59) The length a spring stretched from its natural length with work, W foot-pounds, is given by

$L = \sqrt{\dfrac{2W}{k}}$ where k is a constant for the given spring. If a certain spring has a constant of 66.8, and the spring

is to be stretched 3.2 feet from its natural length, how much work will be necessary?

    A) 684 foot-pounds   B) 106.9 foot-pounds   C) 342 foot-pounds   D) 59.7 foot-pounds

60) The length L of a river is related to the area A of its drainage basin by the formula $L = 1.05\,A^{0.5}$. The Congo River is 4165 miles long. What is the area of its drainage basin?
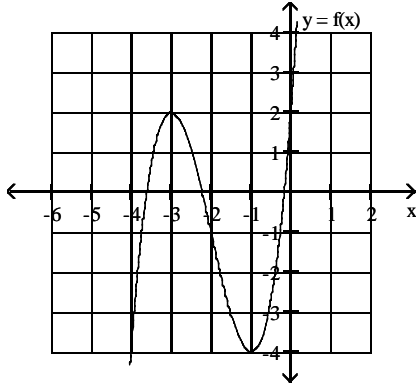
    A) 2536 sq mi   B) 6839 sq mi

    C) about 1.6×10^{-7} sq mi   D) about 1.6×10^7 sq mi

61) Use the graph of f to evaluate f(–3)

A) 0   B) –4   C) 1   D) 2

62) Find f(–4) when $f(x) = 3x^2 - 2x - 2$

     A) 58   B) 54   C) 38   D) 48

63) **Find an exponential function that models the data in the table.**

x	0	1	2	3	4
y	5	20	80	320	1280

     A) $f(x) = 5(4)^x$ B) $f(x) = 15x + 5$ C) $f(x) = 4(5)^x$ D) $f(x) = \frac{1}{15}x + 5$

64) Plutonium–238 decays at a rate of 0.8% per year. How much of a 50–gram sample will be left after t years?

     A) $50(0.2)^t$ B) $50 - 0.8t$ C) $50(0.992)^t$ D) $50(0.8)^t$

65) **Solve the equation:** $3^{(9 - 3x)} = 27$

     A) 9   B) $\frac{1}{2}$ C) 2   D) –2

66) **Solve the equation:** $3^{x + 6} = 4$

     A) $\dfrac{\log 3}{\log 4} + \log 6$ B) $\dfrac{\log 3}{\log 4} + 6$

     C) $\dfrac{\log 4}{\log 3} - 6$ D) $\log 4 - \log 3 - \log 6$

67) **Solve the equation:** $6500 \; 3^{\frac{t}{12}} = 75{,}000$

     A) 5.11   B) 32.16   C) 46.15   D) 26.71

68) **Expand the expression. Assume that all variables are positive.**

$$\log_8 \frac{x^4}{\sqrt{yz^8}}$$

A) $4 \log_8 x - 4 \log_8 y + 4 \log_8 z$

B) $4 \log_8 x - \log_8 yz^8$

C) $\dfrac{8 \log_8 x}{\log_8 y + 8 \log_8 z}$

D) $4 \log_8 x - \dfrac{1}{2} \log_8 y - 4 \log_8 z$

69) **Solve the equation:** $\log(5 + x) - \log(x - 4) = \log 2$

A) $\dfrac{1}{2}$ B) -13 C) 13 D) No solution

70) **Solve the equation:** $\log_9 4 + \log_9 x = 1$

A) $\dfrac{4}{9}$ B) $\sqrt[4]{9}$ C) $\dfrac{1}{4}$ D) $\dfrac{9}{4}$

71) $f(x) = 33.4 + 1.4\log(x + 1)$ gives the salinity of ocean water at depth x meters. Find the salinity (to the nearest hundredth) at a depth of 607 meters.

     A) -29.50 B) 91.58 C) 94.38 D) 37.30

72) How long will it take for a population of 4000 to double if its annual growth rate is 7.1%? (Round to the nearest year.)

     A) 1 yr   B) 10 yr   C) 28 yr   D) 4 yr

73) Find out how long it takes a \$3200 investment to double if it is invested at 8% compounded semiannually. Round to the nearest tenth of a year. Use the formula $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$.

     A) 8.6 years   B) 8.8 years   C) 9 years   D) 9.2 years

74) Find the standard equation of the circle that has a enter at $(-8, 5)$ and a radius of $\sqrt{2}$

     A) $(x - 5)^2 + (y + 8)^2 = 4$ B) $(x + 8)^2 + (y - 5)^2 = 2$

     C) $(x + 5)^2 + (y - 8)^2 = 4$ D) $(x - 8)^2 + (y + 5)^2 = 2$

75) **Find the center and radius of the circle.**

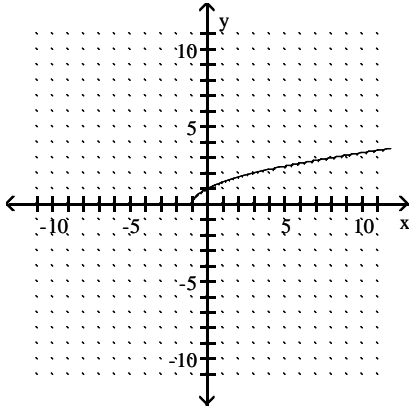$$x^2 + y^2 + 2y = 8$$

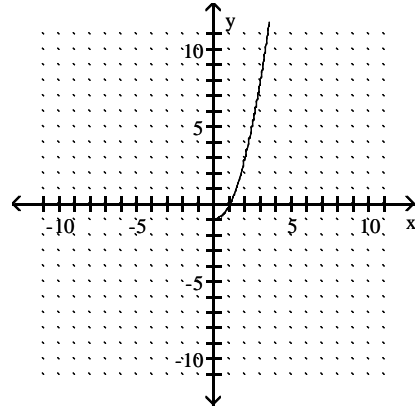   A) $(0, 1); 3$ B) $(0, 2); 2$ C) $(1, 0); 4$ D) $(0, -1); 3$

76) Which graph represents $f(x) = \sqrt{x-1}$; you may use the following table

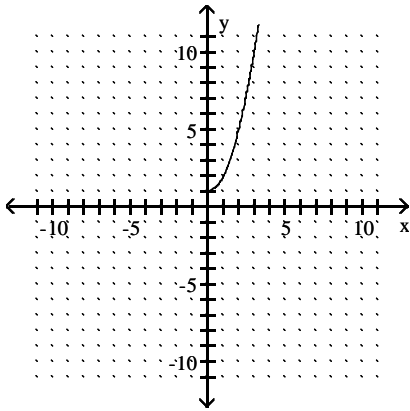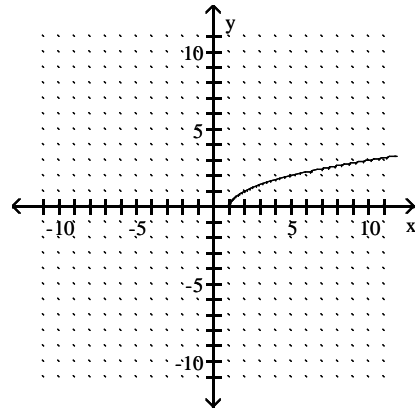| x	f(x)
1	
2	
5	

A)

B)

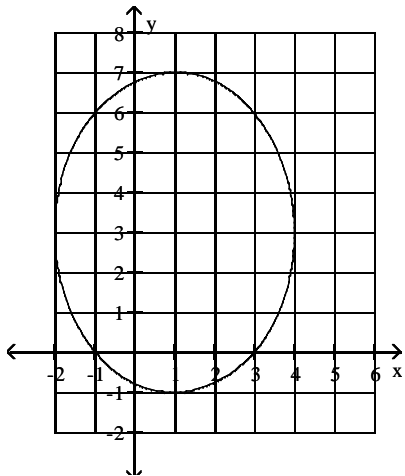

C)

D)

77) The graph below is the graph of the ellipse $\dfrac{(x-h)^2}{9} + \dfrac{(y-3)^2}{16} = 1$. What is the value of h?
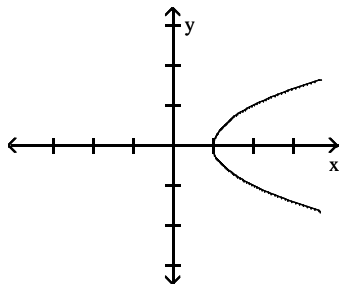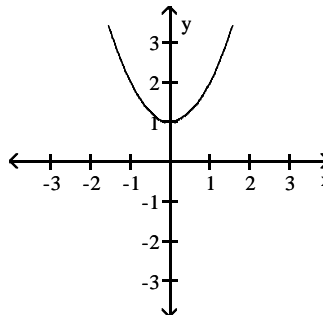

A) 0

B) 1

C) –1

D) 4

12

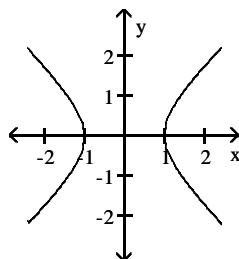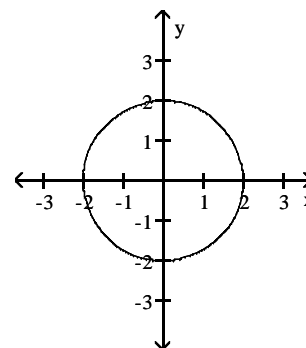78) One of the graphs below is the graph of $x^2 - y^2 = 1$. Which one?
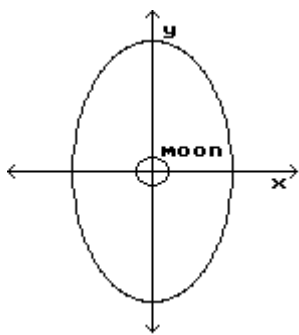
A)

B)

C)

D)

79) A satellite is to be put into an elliptical orbit around a moon. The moon is a sphere with radius of 764 km located at the.center of the elliptical orbit. Determine an equation for the ellipse if the distance of the satellite from the surface of the moon varies from 326 km to 512 km.

A) $\dfrac{x^2}{326} + \dfrac{y^2}{512} = 1$

B) $\dfrac{x^2}{1276^2} + \dfrac{y^2}{1090^2} = 1$

C) $\dfrac{x^2}{1090^2} + \dfrac{y^2}{1276^2} = 1$

D) $\dfrac{x^2}{512} + \dfrac{y^2}{326} = 1$

Answer Key
Testname: MET DRAFT 2008 M125

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

51) C
52) A
53) D
54) B
55) D
56) D
57) C
58) B
59) C
60) D
61) D
62) B
63) A
64) C
65) C
66) C
67) D
68) D
69) C
70) D
71) D
72) B
73) B
74) B
75) D
76) D
77) B
78) C
79) C