

Evaluate.

1) $4[-7 + 5(7 - 8)]$

2) -4^2

3) 5^{-3}

4) $\frac{1}{5} - \frac{2}{3}$

Perform the indicated operation and simplify if possible.

5) $2x^3 - 6x^2 - 8x + 1 - (6x^3 + 8x^2 - 4x + 7)$

6) $(2x + 5)^2$

7) $(7x + 6)(x^2 + 8x + 2)$

Factor.

8) $x^2 - 2x - 80$

9) $4x^3 - 14x^2 - 8x$

10) $12 - 3x^2$

11) $2a^2 + 2ab - 7a - 7b$

12) $5y^3 - 135$

Simplify. Write the answer with positive exponents only.

13) $\left(\frac{x^5y^{-4}}{xy^{-1}}\right)^2$

Solve the equation or inequality. Write inequality solutions in interval notation.

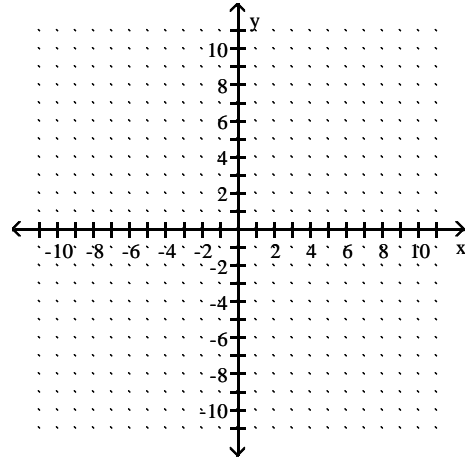
14) $5(n + 4) = -3(5 - 2n)$

15) $3x - 18 \geq 5x - 6$

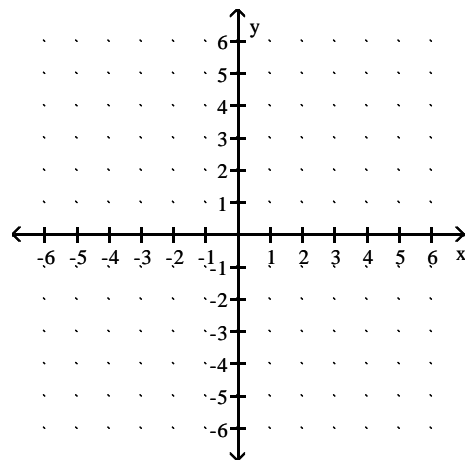
16) $x(x - 5) = 24$

Graph.

17) $2x - 4y = 24$



18) $x + 3 = 0$



Find the slope of the line.

19) Through $(5, -5)$ and $(2, 1)$

20) $-6x + y = 3$

Write the equation of the line. Write the equation in standard form.

21) Through $(2, 5)$ and $(4, 11)$

22) Through $(3, -4)$ and parallel to $x = 6$

Solve the system of equations.

23)
$$\begin{cases} 8x - 12y = 13 \\ -2x + 3y = 2 \end{cases}$$

Solve the system.

$$24) \begin{cases} 4x + 2y + z = 15 \\ 5x - 2y - z = 3 \\ 4x + y + 3z = 19 \end{cases}$$

Divide by long division.

$$25) \frac{4x^3 - 11x}{2x - 1}$$

Use synthetic division to divide.

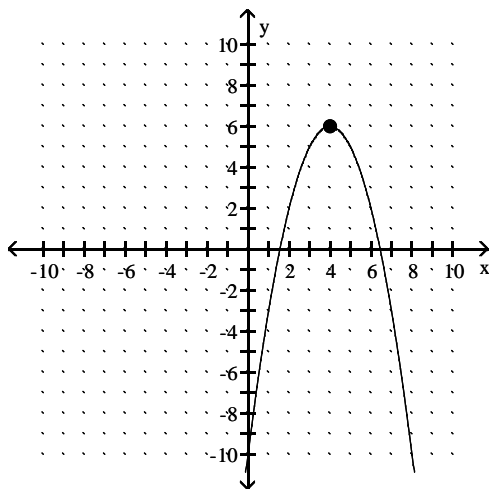
$$26) (x^2 + 3x - 16) \div (x + 6)$$

Answer the question about functions.

27) If $h(x) = x^3 + x$, find
a. $h(-1)$ b. $h(0)$ c. $h(3)$

Find the domain and range of the function graphed.

28)



Solve.

29) Linda and Dave leave simultaneously from the same starting point biking in opposite directions. Linda bikes at 7 miles per hour and Dave bikes at 9 miles per hour. How long will it be until they are 20 miles apart from each other?

30) Find the amount of 14% saline solution a lab assistant should add to 80 cc (cubic centimeters) of a 24% saline solution in order to have a 18% solution.

Find the domain of the rational function.

$$31) f(x) = \frac{x^2 - 25}{x^2 + 17x + 72}$$

Perform the indicated operations and simplify if possible.

$$32) \frac{7x}{x-3} - \frac{21}{x-3}$$

$$33) \frac{x^2 - 25}{x^2 + 5x} \div \frac{xy + 6x - 5y - 30}{5x - 15}$$

$$34) \frac{7a}{a^2 - 6a + 8} - \frac{2}{a - 2}$$

$$35) \frac{9 + \frac{1}{y^2}}{\frac{1}{y} - \frac{8}{y^2}}$$

Solve the equation or inequality. Write inequality solutions in interval notation.

$$36) \frac{10}{y} + \frac{7}{5} = 2$$

$$37) \frac{6}{y+3} = \frac{5}{y+3}$$

$$38) \frac{x}{x-6} = \frac{6}{x-6} - \frac{1}{4}$$

Solve.

39) One number plus ten times its reciprocal is equal to seven.

Simplify. If needed, write answers with positive exponents only.

$$40) \sqrt{72}$$

$$41) \left(\frac{25}{9}\right)^{-1/2}$$

$$42) \left(\frac{125z^{6/5}}{x^{-3/5}y^{6/7}}\right)^{1/3}$$

Perform the indicated operations and simplify if possible.

43) $\sqrt{8x^3} - 3\sqrt{32x^3}$

44) $(\sqrt{11} + \sqrt{5})(\sqrt{11} - \sqrt{5})$

Solve the equation or inequality. Write inequality solutions in interval notation.

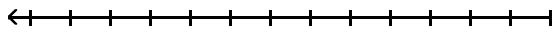
45) $|8x + 5| + 2 = 10$

46) $-6 < 2(x - 4) \leq 2$

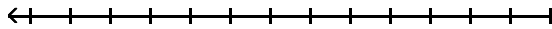
47) $|3x - 2| \geq 9$

Solve the inequality. Graph the solution set.

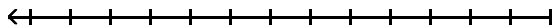
48) $|8k - 2| < -3$



49) $|3k - 8| > -6$



50) $|4k + 3| \leq 8$



Solve the equation or inequality. Write inequality solutions in interval notation.

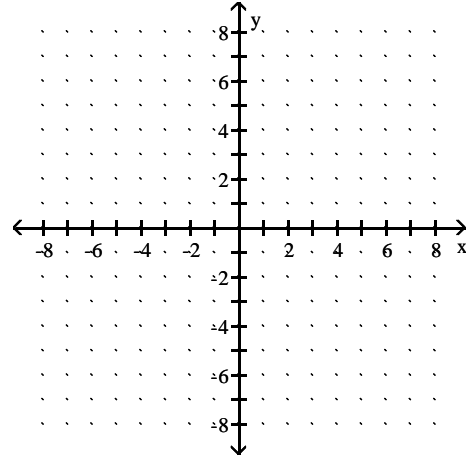
51) $3x^2 + 12x = -5$

52) $x = \sqrt{5x - 9} + 3$

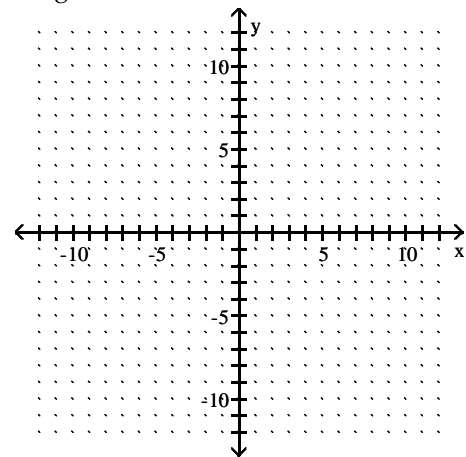
53) $x^2 + 5x \geq -4$

Graph.

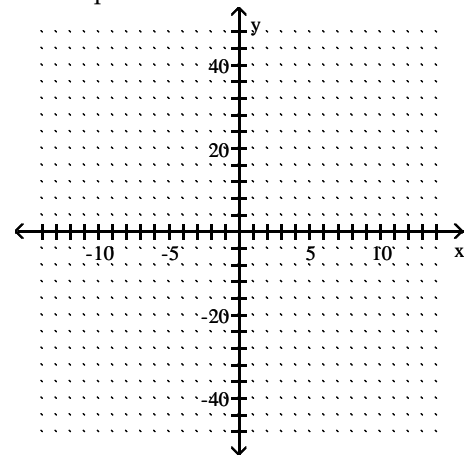
54) $y > -5x$



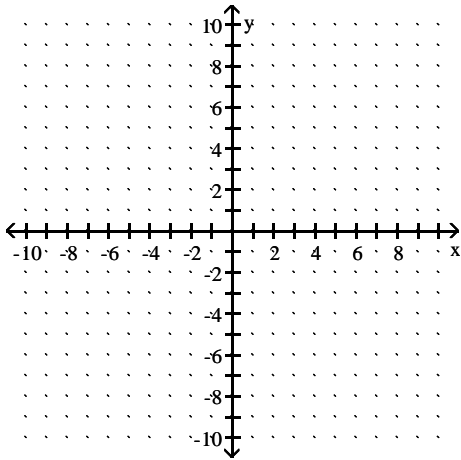
55) $f(x) = |x - 7| + 4$. Also, find the domain and range of this function.



56) $f(x) = x^2 - 4x + 4$. Label the vertex and any intercepts.



57) $f(x) = \begin{cases} -\frac{1}{3}x & \text{if } x < 0 \\ 3x - 5 & \text{if } x \geq 0 \end{cases}$. Also, find the domain and range of this function.



Write an equation of the line. Write the equation using function notation.

58) Through (10, -59) and (3, -17)

59) Through (-3, -13) and perpendicular to $3x + 4y = -9$

Find the distance or midpoint.

60) Find the distance between the points (-4, -6) and (6, 6).

61) Find the midpoint of the line segment whose endpoints are (9, 3) and (-9, -6).

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

62) $\sqrt{\frac{121}{x}}$

63) $\frac{\sqrt{x}}{11 - \sqrt{x}}$

Solve.

64) Suppose that x is inversely proportional v . If $x = 42$ when $v = 5$, find x when $v = 35$.

65) 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.

Perform the indicated operation. Write the result in the form $a + bi$.

66) $-\sqrt{-294}$

67) $(3 - 7i) - (3 - i)$

68) $(9 - 8i)^2$

69) $\frac{7 + 7i}{8 - 5i}$

Provide an appropriate response.

70) If $g(x) = x + 5$ and $h(x) = x^2 + x - 10$, find $(g \circ h)(x)$.

71) Decide whether $f(x) = 7 - 2x$ is a one-to-one function. If it is, find the inverse.

72) Use the properties of logarithms to write the expression as a single logarithm.
 $\log_5 x + 5\log_5 x - \log_5 (x + 4)$

Solve the equation. Give an exact solution.

73) $9^x - 1 = \frac{1}{81}$

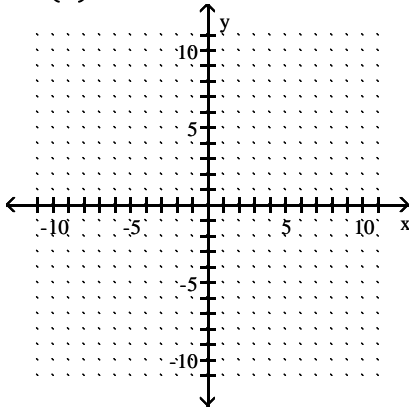
74) $3^{2x + 9} = 10$ Give an exact solution and a 4-decimal-place approximation.

75) $\log_5(3x - 5) = 2$

76) $\log_4(x + 7) - \log_4(x - 2) = 3$

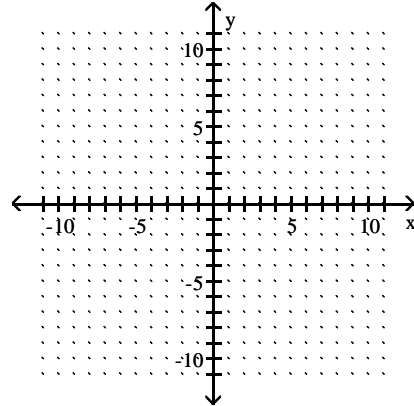
Graph the exponential function.

$$77) y = \left(\frac{1}{3}\right)^x - 1$$



Graph the equation.

$$81) 4x^2 + 16y^2 = 64$$



Solve. Round the answer to the nearest whole number.

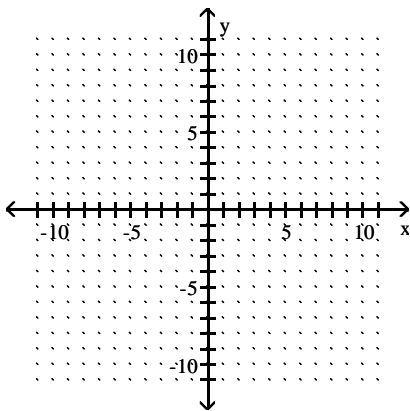
- 78) The size of the bear population at a national park increases at the rate of 5% per year. If the size of the current population is 149, find how many bears there will be in 5 years.

Find the center and the radius of the circle.

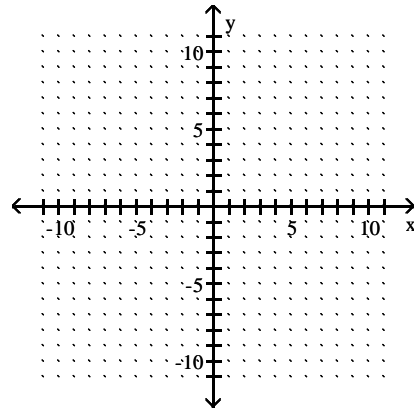
$$79) 3x^2 + 3y^2 = 9$$

Sketch the graph of the equation. If the graph is a parabola, find its vertex. If the graph is a circle, find its center and radius.

$$80) x = y^2 + 4y + 7$$



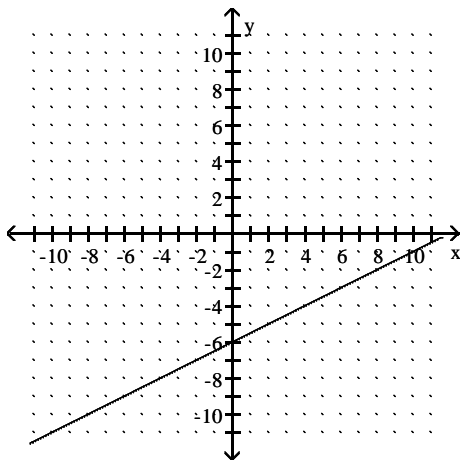
$$82) y^2 - 9x^2 = 9$$



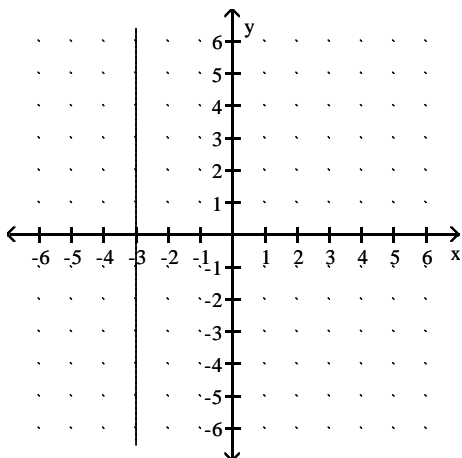
Answer Key

Testname: M125RE_FIN

- 1) -48
- 2) -16
- 3) $\frac{1}{125}$
- 4) $-\frac{7}{15}$
- 5) $-4x^3 - 14x^2 - 4x - 6$
- 6) $4x^2 + 20x + 25$
- 7) $7x^3 + 62x^2 + 62x + 12$
- 8) $(x - 10)(x + 8)$
- 9) $2x(2x + 1)(x - 4)$
- 10) $3(2 + x)(2 - x)$
- 11) $(2a - 7)(a + b)$
- 12) $5(y - 3)(y^2 + 3y + 9)$
- 13) $\frac{x^8}{y^6}$
- 14) 35
- 15) $(-\infty, -6]$
- 16) -3, 8
- 17)



18)



- 19) $m = -2$
- 20) $m = 6$
- 21) $-3x + y = -1$
- 22) $x = 3$
- 23) no solution
- 24) (2, 2, 3)
- 25) $2x^2 + x - 5 - \frac{5}{2x - 1}$
- 26) $x - 3 + \frac{2}{x + 6}$
- 27) a. -2
b. 0
c. 30
- 28) Domain: $(-\infty, \infty)$; range: $(-\infty, 6]$
- 29) $1\frac{1}{4}$ hr
- 30) 120 cc
- 31) $\{x \mid x \text{ is a real number and } x \neq -8, x \neq -9\}$
- 32) 7
- 33) $\frac{5(x - 3)}{x(y + 6)}$

34) $\frac{5a + 8}{(a - 2)(a - 4)}$

35) $\frac{9y^2 + 1}{y - 8}$

36) $\frac{50}{3}$

37) -3

38) no solution

39) 2 or 5

40) $6\sqrt{2}$

41) $\frac{3}{5}$

42) $\frac{5z^{2/5}x^{1/5}}{y^{2/7}}$

43) $-10x\sqrt{2x}$

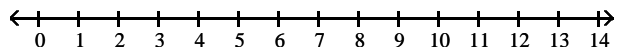
44) 6

45) $\frac{3}{8}, -\frac{13}{8}$

46) $[1, 5]$

47) $\left(-\infty, -\frac{7}{3}\right] \cup \left[\frac{11}{3}, \infty\right)$

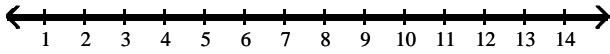
48) \emptyset



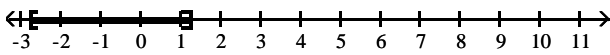
Answer Key

Testname: M125RE_FIN

49) $(-\infty, \infty)$



50) $\left[-\frac{11}{4}, \frac{5}{4}\right]$

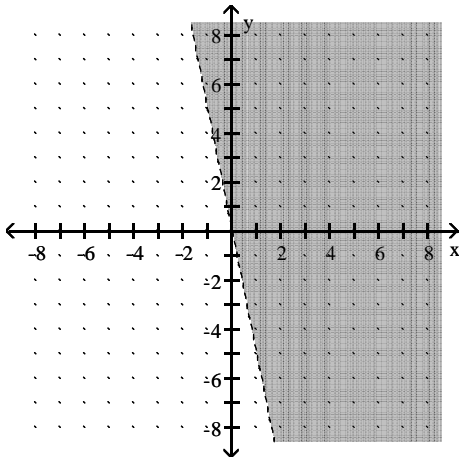


51) $\frac{-6 \pm \sqrt{21}}{3}$

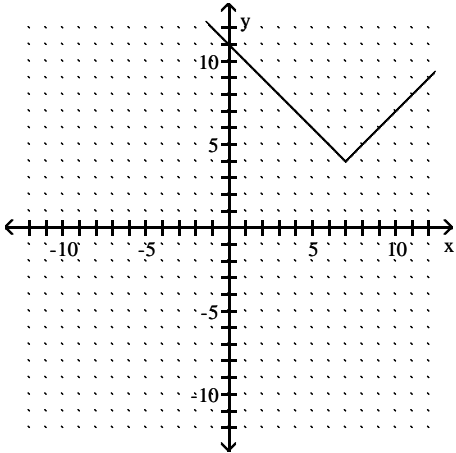
52) 9

53) $(-\infty, -4] \cup [-1, \infty)$

54)

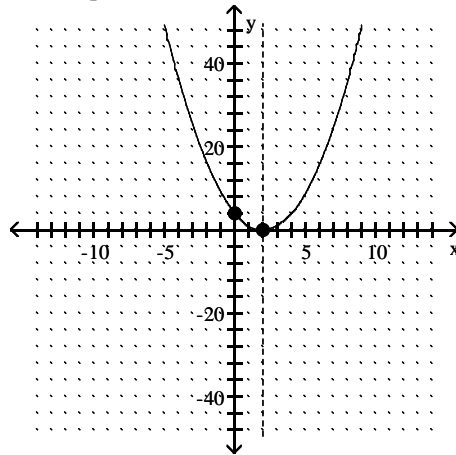


55) Domain: $(-\infty, \infty)$; Range: $[4, \infty)$

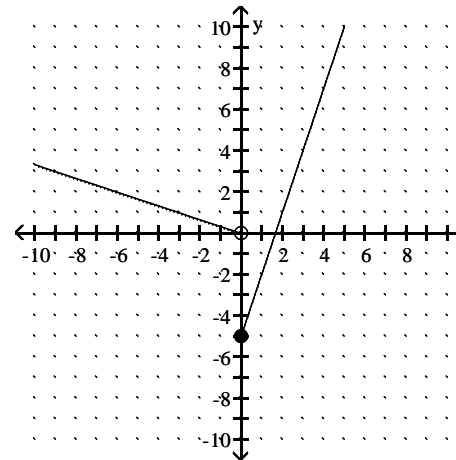


56) vertex $(2, 0)$

intercepts $(0, 4), (2, 0)$



57) Domain: $(-\infty, \infty)$; Range: $(-5, \infty)$



58) $f(x) = -6x + 1$

59) $f(x) = \frac{4}{3}x - 9$

60) $2\sqrt{61}$ units

61) $\left(0, -\frac{3}{2}\right)$

62) $\frac{11\sqrt{x}}{x}$

63) $\frac{11\sqrt{x} + x}{121 - x}$

64) 6

65) maximum height = 75 ft; time to reach ground = 2.5 seconds

66) $0 - 7i\sqrt{6}$

67) $0 - 6i$

68) $17 - 144i$

69) $\frac{21}{89} + \frac{91}{89}i$

Answer Key

Testname: M125RE_FIN

70) $(g \circ h)(x) = x^2 + x - 5$

71) $f^{-1}(x) = \frac{-x+7}{2}$

72) $\log_5 \frac{x^6}{x+4}$

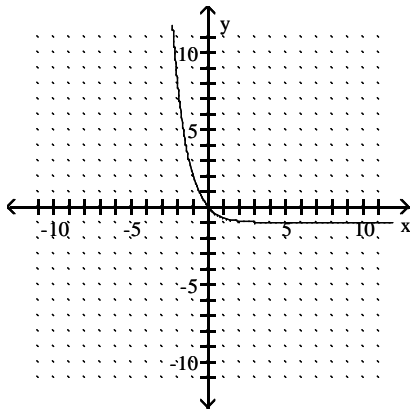
73) -1

74) $\frac{1}{2} \left(\frac{\log 10}{\log 3} - 9 \right); -3.4520$

75) 10

76) $\frac{15}{7}$

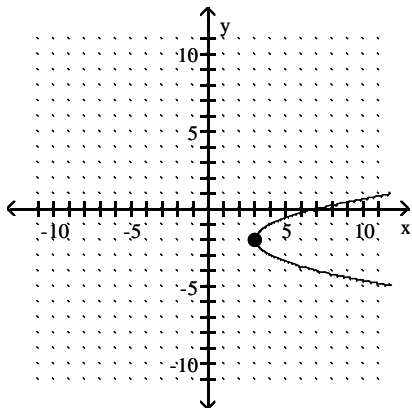
77)



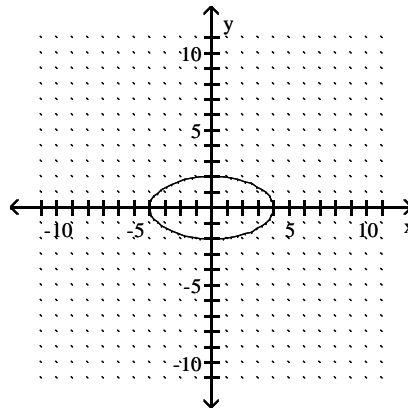
78) 190 bears

79) center (0, 0), radius = $\sqrt{3}$

80) vertex (3, -2)



81)



82)

