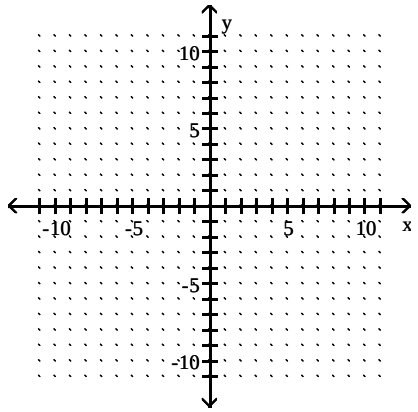
Math 1010 - Intermediate Algebra

Graph.

1) $16y^2 - 9x^2 = 144$



Find the equation of a circle satisfying the given conditions.

2) Center: (–5, 9); radius: 5 2) _____

A) $(x + 9)^2 + (y - 5)^2 = 5$ B) $(x + 5)^2 + (y - 9)^2 = 25$

C) $(x - 5)^2 + (y + 9)^2 = 25$ D) $(x - 9)^2 + (y + 5)^2 = 5$

Find the center and radius of the circle.

3) $x^2 + y^2 + 2x - 14y + 14 = 0$ 3) _____

A) (–1, 7); r = 6 B) (1, –7); r = 36 C) (7, –1); r = 6 D) (–7, 1); r = 36

Identify the graph of the equation as a parabola, circle, ellipse, or hyperbola.

4) $y^2 = 100 - x^2$ 4) _____

A) Hyperbola B) Ellipse C) Circle D) Parabola

5) $9x^2 = 4y^2 + 36$ 5) _____

A) Hyperbola B) Parabola C) Ellipse D) Circle

6) $9x^2 + 16y^2 = 144$ 6) _____

A) Ellipse B) Circle C) Hyperbola D) Parabola

7) $7y = 4(x + 7)^2$ 7) _____

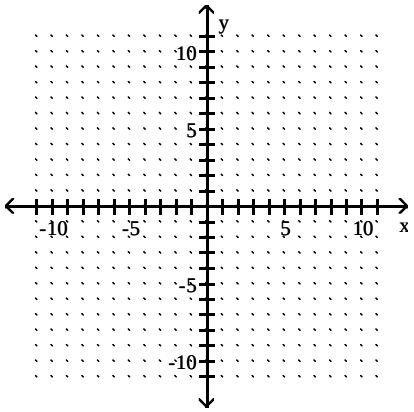
A) Circle B) Ellipse C) Hyperbola D) Parabola

8) $(x - 2)^2 = 64 - y^2$ 8) _____

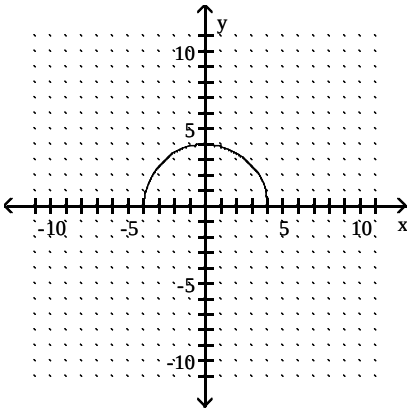
A) Ellipse B) Hyperbola C) Circle D) Parabola

Graph.

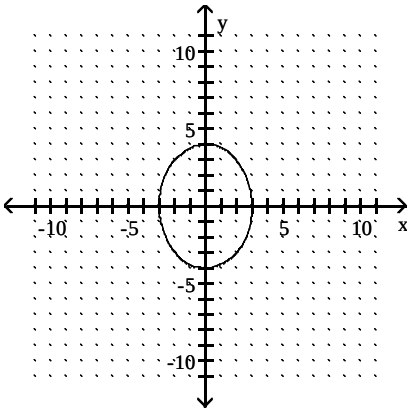
9) $\frac{y}{4} = -\sqrt{\frac{16 - x^2}{16}}$ 9) _____



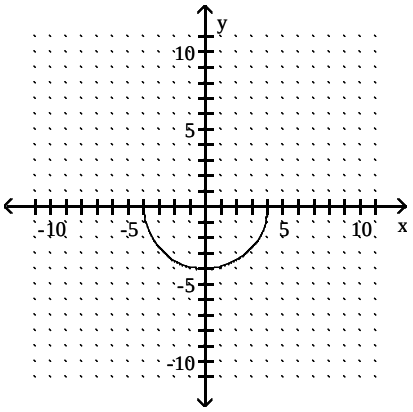
A)



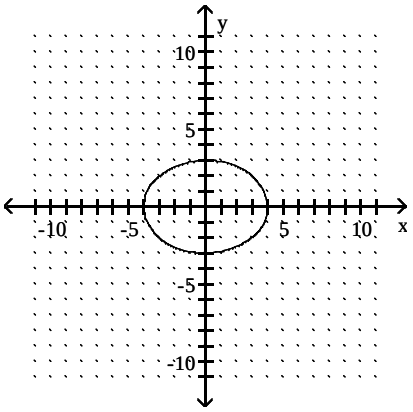
B)



C)



D)



Solve the equation.

10) $25x^4 - 61x^2 + 36 = 0$ 10) _____

A) $\left\{-1, -\frac{5}{6}, \frac{5}{6}, 1\right\}$

B) $\left\{1, \frac{6}{5}\right\}$

C) $\left\{-1, -\frac{5}{6}\right\}$

D) $\left\{-\frac{6}{5}, -1, 1, \frac{6}{5}\right\}$

11) $\frac{2}{2x} - \frac{2}{x+2} = 1$ 11) _____

A) $\varnothing$

B) $\left\{\frac{3+\sqrt{17}}{2}, \frac{3-\sqrt{17}}{2}\right\}$

C) $\left\{\frac{-5+\sqrt{17}}{2}, \frac{-5-\sqrt{17}}{2}\right\}$

D) $\left\{\frac{-3+\sqrt{17}}{2}, \frac{-3-\sqrt{17}}{2}\right\}$

12) $7x^2 + 9x + 4 = 0$ 12) _____

A) $\left\{\frac{-9+\sqrt{31}}{14}, \frac{-9-\sqrt{31}}{14}\right\}$

B) $\left\{\frac{9+i\sqrt{31}}{14}, \frac{9-i\sqrt{31}}{14}\right\}$

C) $\left\{\frac{-9+i\sqrt{31}}{14}, \frac{-9-i\sqrt{31}}{14}\right\}$

D) $\left\{\frac{9+\sqrt{31}}{14}, \frac{9-\sqrt{31}}{14}\right\}$

Solve the problem. Round your answer to the nearest tenth, when appropriate.

13) A rock falls from a tower that is 49 m high. As it is falling, its height is given by the formula $h = 49 - 4.9t^2$. How many seconds will it take for the rock to hit the ground (h=0)? 13) _____

A) 490 sec B) 3.2 sec C) 6.6 sec D) 7 sec

Solve the equation for the indicated variable. (Leave ± in your answer, when appropriate.)

14) $c^2 + d^2 + f^2 = g^2$, for c 14) _____

A) $c = g^2 - d^2 - f^2$

B) $c = -g + d + f$

C) $c = g - d - f$

D) $c = \pm\sqrt{g^2 - d^2 - f^2}$

15) $aS^2 + bS = c$, for S 15) _____

A) $S = \frac{-b+\sqrt{b^2-4ac}}{2a}$

B) $S = \frac{-b+b^2+4ac}{2a}$

C) $S = \frac{-b+\sqrt{b^2+4ac}}{2a}$

D) $S = \frac{-b+b^2-4ac}{2a}$

Simplify the expression. Assume that all variables represent positive real numbers.

16) $(-27)^{-2/3}$ 16) _____

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

17) $\frac{5^{3/4}x^{-2/2}y^{3/2}}{5^{-5/4}x^{4/2}y^{1/4}}$ 17) _____

A) $\frac{25y^{5/4}}{x^2}$ B) $\frac{25y^{5/8}}{x^4}$ C) $\frac{125y^{5/4}}{x^3}$ D) $\frac{25y^{5/4}}{x^3}$

Simplify. Assume that all variables represent positive real numbers.

18) $\sqrt{24} + 6\sqrt{150} - 3\sqrt{216}$ 18) _____

A) $-14\sqrt{6}$ B) $-150\sqrt{6}$ C) $27\sqrt{6}$ D) $14\sqrt{6}$

19) $(3 - 2\sqrt{5})^2$ 19) _____

A) $9 - 4\sqrt{5}$ B) $9 + 4\sqrt{5}$ C) $29 + 12\sqrt{5}$ D) $29 - 12\sqrt{5}$

Simplify.

20) i^{21} 20) _____

A) -1 B) 1 C) $-i$ D) i

Add or subtract as indicated. Write your answer in the form a + bi.

21) $[(6 + 9i) - (4 + 10i)] - (10 - 4i)$ 21) _____

A) $-8 + 15i$ B) $20 + 3i$ C) $-8 + 3i$ D) $20 + 15i$

Simplify. Assume that all variables represent positive real numbers.

22) $\dfrac{-20}{\sqrt{8} + \sqrt{3}}$ 22) _____

A) $-4(\sqrt{8} + \sqrt{3})$ B) $-4(\sqrt{8} - \sqrt{3})$ C) $4(\sqrt{8} - \sqrt{3})$ D) $-(\sqrt{8} - \sqrt{3})$

Solve the equation.

23) $5x + \sqrt{x + 20} = 5 + 3x$ 23) _____

A) {10} B) {25} C) $\{5, \frac{1}{4}\}$ D) $\{-5, -\frac{1}{4}\}$

Perform the indicated operation. Give answer in standard form.

24) $(4 + 5i)(9 + 4i)$ 24) _____

A) $56 + 29i$ B) $20i^2 + 61i + 36$ C) $16 + 61i$ D) $16 - 61i$

Solve the equation.

25) $\dfrac{x}{16} - \dfrac{3}{8} = \dfrac{x - 8}{8}$ 25) _____

A) {10 } B) {2 } C) {13 } D) {5 }

Solve the compound inequality.

26) $-6 \le 3x + 6$ and $2x + 9 < 9$ 26) _____

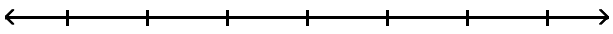
A) $[-4, 0)$ B) $(-4, 0]$ C) $(-4, 0)$ D) $[-4, 0]$

27) $-3x \le -9$ or $9x - 6 < 3x$ 27) _____

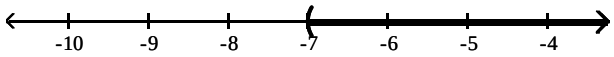
A) $\varnothing$ B) $[1, 3]$ C) $(1, 3)$ D) $(-\infty, 1) \cup [3, \infty)$

Solve the inequality. Write the solution set in interval notation and graph it.

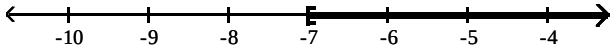
28) $12x - 18 > 3(3x - 13)$ 28) _____



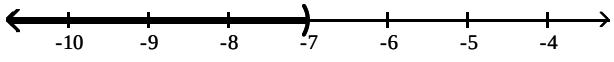
A) $(-7, \infty)$



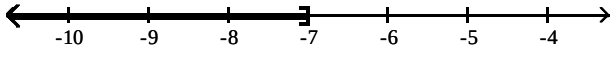
B) $[-7, \infty)$



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



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



Solve the absolute value equation or inequality. Give the solution set in interval form.

29) $|-3x - 6| - 5 < -1$ 29) _____

A) $\left(-\frac{10}{3}, -\frac{2}{3}\right)$

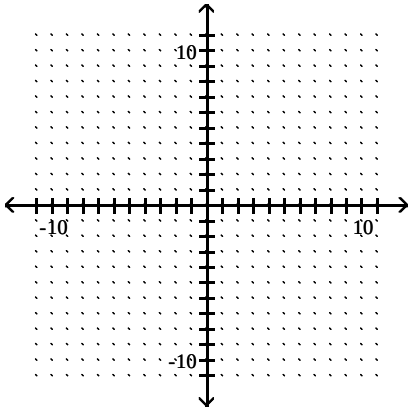
B) $\emptyset$

C) $\left(-\infty, -\frac{10}{3}\right) \cup \left(-\frac{2}{3}, \infty\right)$

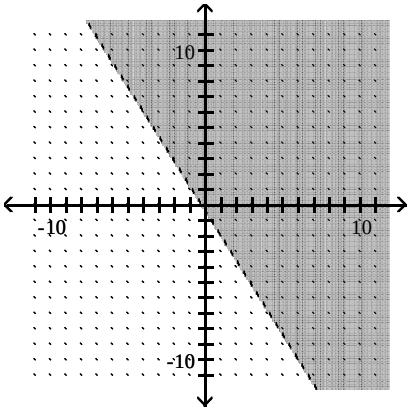
D) $\left(-\infty, -\frac{10}{3}\right)$

Graph the inequality or compound inequality.

30) $8x + 5y > -2$ 30) _____



A)



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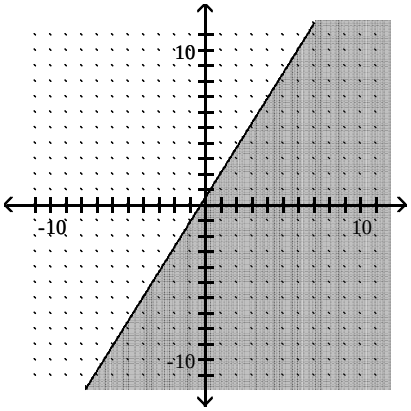
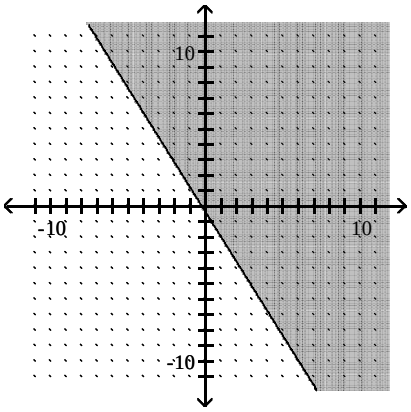
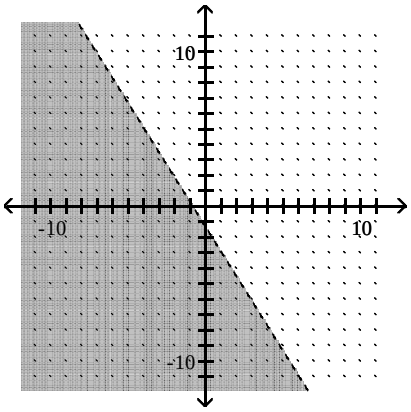


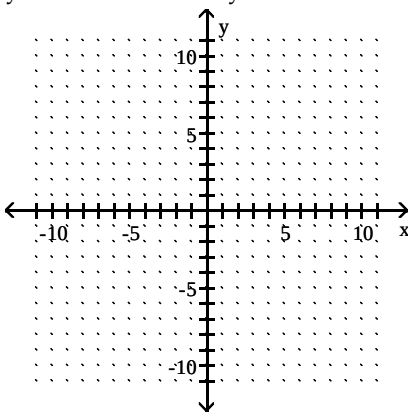
C)



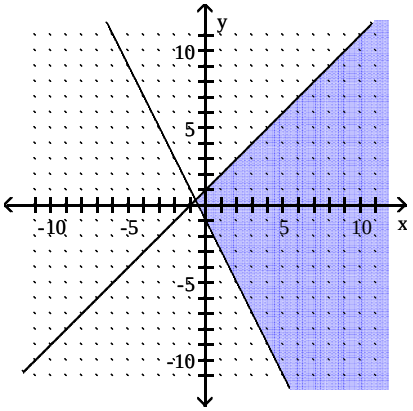
D)



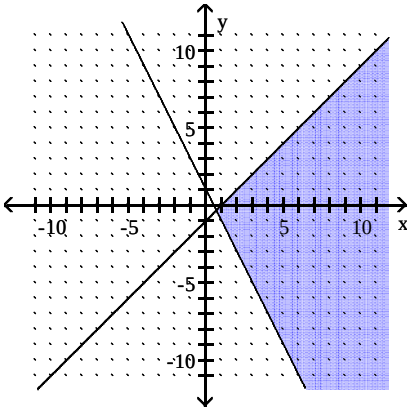
31) $y \geq -2x - 1$ and $x - y \geq -1$ 31) _____



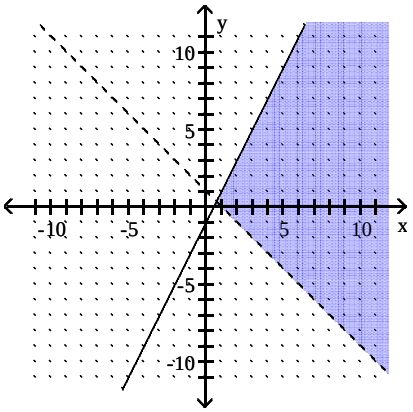
A)



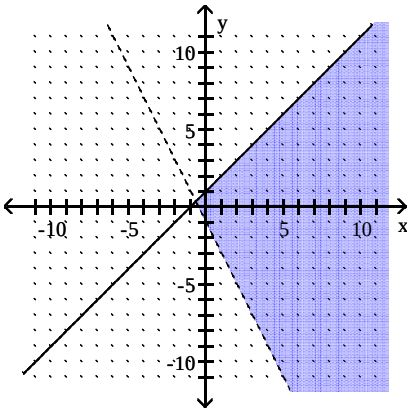
B)



C)

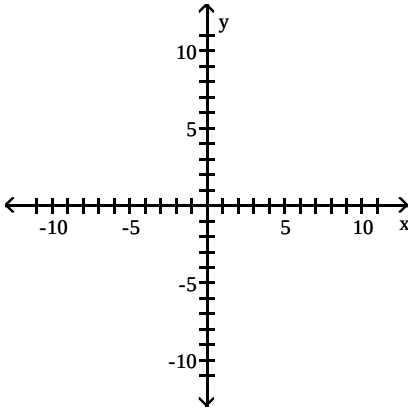


D)

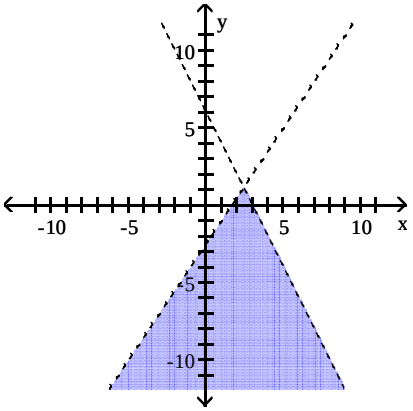


Graph the compound inequality.

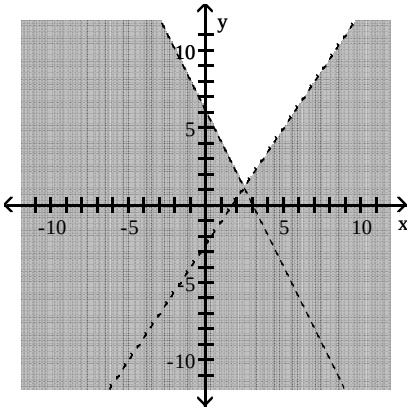
32) $2x + y < 6$ or $3x - 2y > 5$ 32) _____



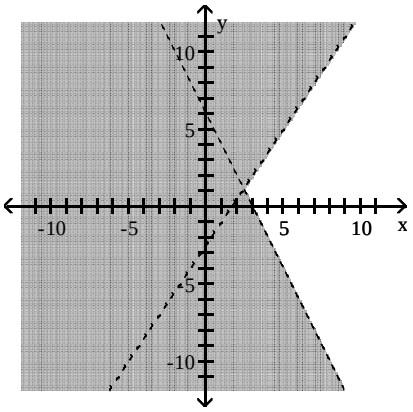
A)



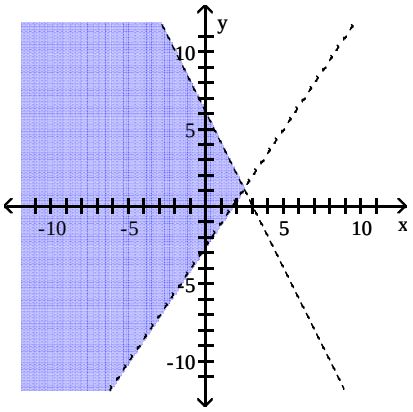
B)



C)



D)



Solve the equation.

33) $\log_{1/3} x = -4$ 33) _____

A) $\left\{\frac{1}{81}\right\}$ B) {64} C) {81} D) $\left\{\frac{1}{64}\right\}$

Solve, giving the correct solution to four decimal places.

34) $8^x = 22$ 34) _____

A) {0.6700} B) {2.0116} C) {1.4865} D) {2.7500}

Solve the equation.

35) $\log_3 (x - 2) + \log_3 (x - 8) = 3$ 35) _____

A) $x = 11$ B) $x = 12$ C) $x = -1$ D) $x = 11, x = -1$

If the following defines a one–to–one function, find its inverse. If not, write "Not one–to–one."

36) $f(x) = 8x + 5$ 36) _____

A) Not one–to–one B) $f^{-1}(x) = \frac{x - 5}{8}$

C) $f^{-1}(x) = \frac{x}{8} - 5$ D) $f^{-1}(x) = \frac{x + 5}{8}$

37) $f(x) = -3x^2 - 2$ 37) _____

A) Not one–to–one B) $f^{-1}(x) = \sqrt{\frac{x + 2}{-3}}$

C) $f^{-1}(x) = \frac{x + 2}{-3}$ D) $f^{-1}(x) = \pm\sqrt{\frac{x + 2}{-3}}$

Solve the equation. Give the exact solution.

38) $4^x = \frac{1}{256}$ 38) _____

A) $\{4\}$ B) $\{-4\}$ C) $\left\{\frac{1}{64}\right\}$ D) $\left\{\frac{1}{4}\right\}$

Solve by using the square root property.

39) $(3x + 6)^2 = 4$ 39) _____

A) $\left\{-\frac{4}{3}, -\frac{8}{3}\right\}$ B) $\left\{-\frac{4}{3}, 0\right\}$ C) $\left\{\frac{4}{3}, \frac{8}{3}\right\}$ D) $\left\{\frac{2}{3}\right\}$

Solve the problem.

40) Ron can mow the lawn in two hours more time than Paul. Working together they can mow the lawn in 3 hours. How long does it take each of them working alone? Round your answers to the nearest tenth of an hour, if necessary. 40) _____

A) Paul: 7.2 hr
Ron: 5.2 hr

B) Paul: 4 hr
Ron: 8 hr

C) Paul: 5.2 hr
Ron: 7.2 hr

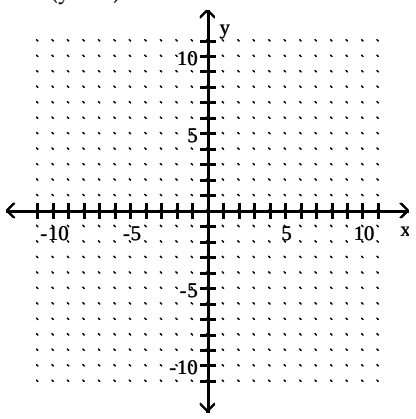
D) Paul: 8 hr
Ron: 4 hr

41) A ladder is resting against a wall. The top of the ladder touches the wall at a height of 15 ft. Find the length of the ladder if the length is 5 ft more than its distance from the wall. 41) _____

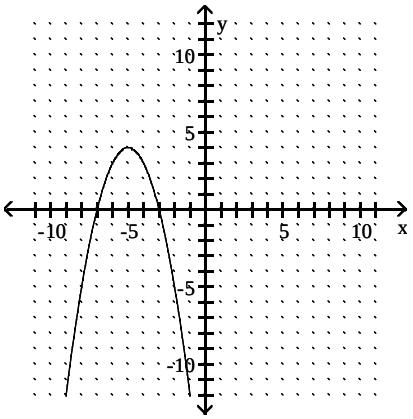
A) 25 ft B) 20 ft C) 30 ft D) 15 ft

Graph the parabola. Identify the vertex, axis, domain and range.

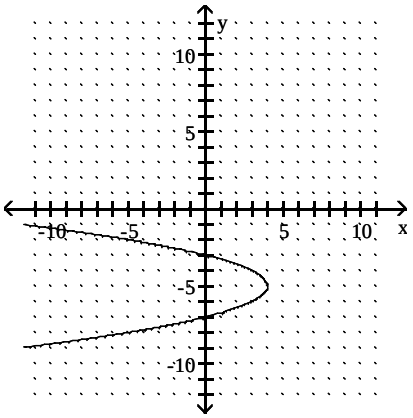
42) $x = (y + 5)^2 + 4$ 42) _____



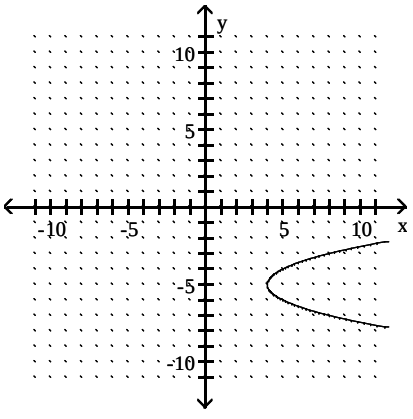
A) Vertex: (1, 1); Axis: x = –5;
Domain: (–∞, ∞); Range: (–∞, 4]



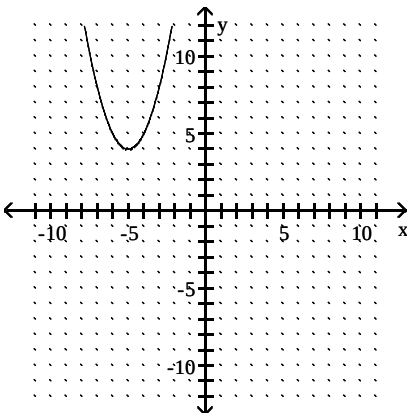
B) Vertex: (4, –5); Axis : y = –5;
Domain: (–∞, 4]; Range: (–∞, ∞)



C) Vertex: (4, –5); Axis : y = –5;
Domain: [4, ∞); Range: (–∞, ∞)



D) Vertex: (–1, –5); Axis: x = –5;
Domain: (–∞, ∞); Range: [4, ∞)



Solve the problem.

43) The percent increase for in–state tuition at a certain public university during the years 1991 through 1999 can be modeled by the quadratic function defined by

$f(x) = 0.156x^2 - 2.06x + 10.1$,

where $x = 1$ represents 1991, $x = 2$ represents 1992, and so on.

(i) Based on this model, by what percent (to the nearest tenth) did tuition increase in 1998?

(ii) In what year was the minimum tuition increase? (Round down to the nearest year.) To the nearest tenth, by what percent did tuition increase that year?

43) _____

A) (i) 3.3%; (ii) 1996; 3.4%

B) (i) 3.6%; (ii) 1996; 3.4%

C) (i) 46.3%; (ii) 1997; 32.2%

D) (i) 4.2%; (ii) 1995; 3.7%

Solve the equation for the indicated variable. (Leave ± in your answer, when appropriate.)

44) $x = \pm\sqrt{r^2 - y^2}$ for r 44) _____

A) $r = \pm\sqrt{x + y}$

B) $r = \pm\sqrt{x^2 - y^2}$

C) $r = \pm\sqrt{x^2 + y^2}$

D) $r = x + y$

Evaluate.

45) $\sqrt[3]{-216}$ 45) _____

A) –36

B) 6i

C) –6

D) 6

Decide whether or not the ordered pair is a solution of the system.

46) (– 2, – 1) 46) _____

$y + 2x = -5$

$x + y = -3$

A) Yes

B) No

Solve the system by substitution or elimination. If a system is inconsistent or has dependent equations, say so.

47) $x + 8y = 41$ 47) _____

$3x + 7y = 55$

A) {(–9, 5)}

B) {(9, 4)}

C) {(8, 5)}

D) ∅; inconsistent system

48) $x - 4y = 3$ 48) _____

$x = 5 + 4y$

A) {(3, 4)}

B) {(3, 0)}

C) $\{(x, y) \mid x - 4y = 3\}$; dependent equations

D) ∅; inconsistent system

For the given pair of functions, find the requested function.

49) Let $f(x) = 2x^2 - 4x - 1$ and $g(x) = x - 1$; $(f \circ g)(x)$. 49) _____

A) $2x^2 - 8x - 3$

B) $2x^2 - 6x - 3$

C) $2x^2 - 8x + 5$

D) $-8x^2 + 2x + 5$

Evaluate the composition of functions.

50) Let $f(x) = 7x + 3$ and $g(x) = x + 6$. Find $(f \circ g)(4)$. 50) _____

A) 37

B) 41

C) 310

D) 73

For the polynomial function, find the requested value.

51) $f(x) = 8x + 7$; $f(4)$ 51) _____

A) 25

B) 64

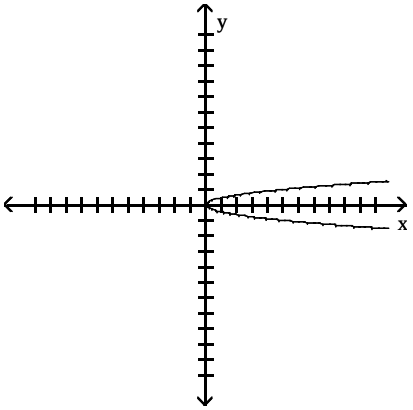
C) 15

D) 39

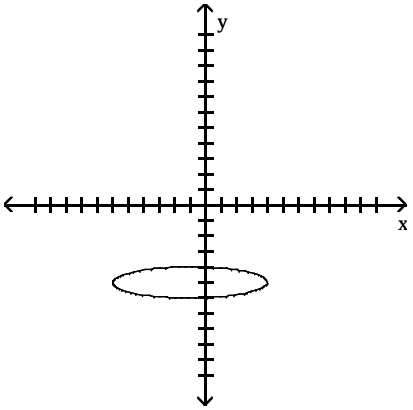
Provide an appropriate response.

52) Which one of the following is the graph of a function? 52) _____

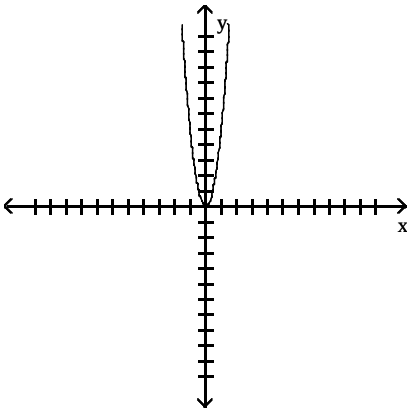
A)



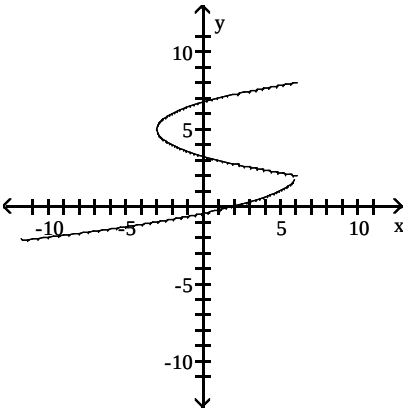
B)



C)



D)



Find an equation of the line, and write it in (a) slope–intercept form if possible and (b) standard form.

53) Through (–6, 2); horizontal 53) _____

A) (a) not possible
(b) $x = -6$

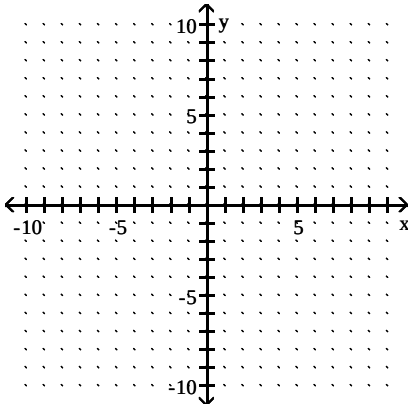
B) (a) $y = 2$
(b) $y = 2$

C) (a) not possible
(b) $x = -2$

D) (a) $y = 6$
(b) $y = 6$

Find the x– and y–intercepts, and graph the equation.

54) $4x - 5y = -20$



Find an equation of the line passing through the two points. Write the equation in standard form.

55) (1, –2) and (–2, 9) 55) _____

A) $3x - 11y = -93$ B) $11x + 3y = 5$

C) $-11x + 3y = 5$ D) $-3x + 11y = -93$

Find any values of the variable for which the rational expression is undefined. Write answer with $\neq$.

56) $\dfrac{x^2 - 4}{x^2 - 11x + 30}$ 56) _____

A) $x \neq 0$ B) $x \neq 2, x \neq -2$ C) $x \neq -5, x \neq -6$ D) $x \neq 5, x \neq 6$

Write the rational expression in lowest terms.

57) $\dfrac{y^2 + 2y - 15}{y^2 - 4y - 45}$ 57) _____

A) $-\dfrac{y^2 + 2y - 15}{y^2 - 4y - 45}$ B) $\dfrac{2y - 15}{-4y - 45}$ C) $\dfrac{2y - 1}{-4y - 3}$ D) $\dfrac{y - 3}{y - 9}$

Multiply or divide. Write the answer in lowest terms.

58) $\dfrac{3(p - 1)}{p} \div \dfrac{8(p - 1)}{4p^2}$ 58) _____

A) $\dfrac{3p}{2}$ B) $\dfrac{12p^3 - 12p^2}{8p^2 - 8p}$

C) $\dfrac{2}{3p}$ D) $\dfrac{24p^2 + 48p + 24}{4p^3}$

Add or subtract. Write the answer in lowest terms.

59) $\dfrac{4x}{x + 6} + \dfrac{3}{x - 6}$ 59) _____

A) $\dfrac{4x + 3}{(x + 6)(x - 6)}$ B) $\dfrac{4x^2 - 21x + 18}{x^2 + 12x + 36}$ C) $\dfrac{4x^2 - 21x + 18}{x^2 - 36}$ D) $\dfrac{4x^2 - 21x + 18}{x^2 - 12x + 36}$

Solve the equation.

60) $\dfrac{4}{x - 4} + \dfrac{4}{2x - 8} = 6$ 60) _____

A) {1} B) {5} C) {60} D) {–3}

61) $\dfrac{5}{m - 2} - \dfrac{8}{m + 2} = \dfrac{2}{m^2 - 4}$ 61) _____

A) {–8} B) {8} C) {8, –8} D) $\varnothing$

Factor completely. If the polynomial is prime, say so.

62) $16y^4 - 56y^3 - 32y^2$ 62) _____

A) $8y^2(2y - 1)(y + 4)$ B) $y^2(16y - 8)(y + 4)$

C) $8y^2(2y + 1)(y - 4)$ D) Prime

63) $x^4 - 1$ 63) _____

A) $(x^2 - 1)(x + 1)(x - 1)$ B) $(x + 1)^2(x - 1)^2$

C) $(x^2 + 1)(x + 1)(x - 1)$ D) Prime

Solve the equation.

64) $3r^2 - 5r - 2 = 0$ 64) _____

A) $\left\{\frac{1}{5}, -\frac{1}{3}\right\}$ B) {–3, 2} C) $\left\{-\frac{1}{3}, 3\right\}$ D) $\left\{-\frac{1}{3}, 2\right\}$

Factor completely. If the polynomial is prime, say so.

65) $x^2 + 4$ 65) _____

A) $(x + 2)^2$ B) $(x + 2)(x - 2)$ C) $(x - 2)^2$ D) Prime

Find the vertex of the parabola.

66) $f(x) = 2x^2 + 16x + 29$ 66) _____

A) (3, 4) B) (–3, –4) C) (–4, –3) D) (4, 3)

Evaluate the expression.

67) $5^{-1} + 2^{-1}$ 67) _____

A) $\frac{10}{7}$ B) $\frac{1}{3}$ C) $\frac{7}{10}$ D) 2

Simplify. Write the answer using only positive exponents. Assume all variables represent nonzero numbers.

68) $\frac{(x^{-3})^{-7}(x^{-1}y)^2}{(xy^{-7})^2}$ 68) _____

A) $x^{21}y^{16}$ B) $x^{20}y^5$ C) $x^{42}y^{-12}$ D) $x^{17}y^{16}$

Write the number in scientific notation.

69) The earth is approximately 92,900,000 miles from the sun. 69) _____

A) 9.29×10^7 B) 9.29×10^8 C) 9.29×10^6 D) 9.29×10^{-7}

Perform the indicated operation.

70) $(7x - 11y)^2$ 70) _____

A) $49x^2 - 154xy + 121y^2$ B) $7x^2 + 121y^2$

C) $49x^2 + 121y^2$ D) $7x^2 - 154xy + 121y^2$

Write the expression in the form a + bi.

71) $\frac{6 + 2i}{9 - 3i}$ 71) _____

A) $\frac{8}{15} + \frac{2}{5}i$ B) $\frac{5}{6} - \frac{1}{12}i$ C) $-\frac{48}{65} - \frac{36}{65}i$ D) $\frac{14}{15}$

Write an equation for the line. Give the final answer in slope–intercept form.

72) Through (1, –5) and (–3, –8) 72) _____

A) $y = -\frac{6}{5}x - \frac{22}{5}$ B) $y = \frac{3}{4}x - \frac{23}{4}$ C) $y = -\frac{3}{4}x - \frac{23}{4}$ D) $y = \frac{6}{5}x - \frac{22}{5}$

Find the slope of the line.

73) $x = 10$ 73) _____

A) 10 B) 1 C) Undefined D) 0

Solve the equation.

74) $6 - (x - 2) = -6x + 5(x + 10)$ 74) _____

A) $\{21\}$ B) $\left\{\frac{42}{0}v\right\}$

C) {all real numbers} D) $\varnothing$

Solve the problem.

75) In the previous baseball season, team A won the most games of any major league team. Team A won 134 less than three times as many games as they lost. They played 162 regular-season games. How many wins and losses did team A have? 75) _____

A) Wins: 86; losses: 76 B) Wins: 88; losses: 74

C) Wins: 89; losses: 73 D) Wins: 88; losses: 75

76) Find the measure of an angle, if its supplement measures 58° more than twice its complement. 76) _____

A) 116° B) 68° C) 58° D) 32°

Solve the equation.

77) $\frac{4x - 2}{5} = \frac{6x + 5}{10}$ 77) _____

A) $\frac{9}{2}$ B) $\frac{1}{14}$ C) $\frac{1}{2}$ D) $\frac{9}{14}$

Solve the problem.

78) From a point on a straight road, two cars are driven in opposite directions, one at 48 miles per hour and the other at 58 miles per hour. In how many hours will they be 424 miles apart? 78) _____

A) 4 hours B) 3 hours

C) Not enough information D) 5 hours

79) A woman has $1.70 in dimes and nickels. She has 2 more dimes than nickels. How many nickels does she have? 79) _____

A) 12 nickels B) 14 nickels C) 8 nickels D) 10 nickels

80) Thompson's Hardware spent $75,910 this year on advertising alone. If total sales were $886,600, what percent of total sales was spent on advertising? Round to the nearest tenth of a percent, if necessary. 80) _____

A) 8.6% B) 117% C) 11.7% D) 0.9%

81) An investment broker invests $109,800 in real estate and earns 2% per year on the investment. How much money is earned per year? 81) _____

A) $549,000 B) $21,960 C) $2196 D) $5,490,000

82) How many liters of a 40% alcohol solution must be mixed with 20 liters of a 90% solution to get a 60% solution? 82) _____

A) 50 L B) 5 L C) 3 L D) 30 L

83) Mardi received an inheritance of $70,000. She invested part at 12% and deposited the remainder in tax–free bonds at 8%. Her total annual income from the investments was $8000. Find the amount invested at 12%. 83) _____

A) $60,000 B) $62,000 C) $30,000 D) $59,000

84) A plane flies 500 miles with the wind and 320 miles against the wind in the same length of time. If the speed of the wind is 27 mph, what is the speed of the plane in still air? 84) _____

A) 113 mph B) 128 mph C) 148 mph D) 123 mph

85) A plane flies 420 miles with the wind and 340 miles against the wind in the same length of time. If the speed of the wind is 22 mph, what is the speed of the plane in still air? 85) _____

A) 214 mph B) 209 mph C) 234 mph D) 199 mph

86) John and Tony start from Grays lake at the same time and head for a town 10 miles away. John walks twice as fast as Tony and arrives 3 hours before Tony. Find how fast each walks. 86) _____

A) Tony: $\frac{5}{3}$ mph; John: $\frac{10}{3}$ mph

B) Tony: 3 mph; John: 6 mph

C) Tony: $\frac{3}{5}$ mph; John: $\frac{6}{5}$ mph

D) Cannot be determined without more information

87) An express train and a local train both leave Gray's Lake at 3 P.M. and head for Chicago 50 miles away. The express travels twice as fast as the local and arrives 1 hour ahead of the local. Find the speed of each train. 87) _____

A) Express: 60 mph; local: 30 mph

B) Express: 25 mph; local: 12.5 mph

C) Express: 50 mph; local: 25 mph

D) Cannot be determined without more information

88) Jill is 9 km away from Joe. Both begin to walk toward each other at the same time. Jill walks at 2.5 km per hour. If they meet in 2 hours, how fast is Joe walking? 88) _____

A) 3 km per hour B) 2.5 km per hour

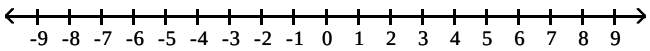
C) 2 km per hour D) 4 km per hour

89) During the 1998–1999 Junior Hockey League season, the Sharks played 58 games. Together, their wins and losses totaled 51. They tied 14 fewer games than they lost. How many games did they lose that season? 89) _____

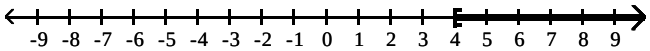
A) 7 games B) 30 games C) 21 games D) 19 games

Solve the inequality and graph the solution set.

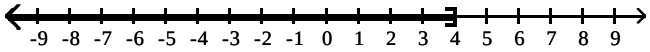
90) $-10x + 5(x - 6) \geq 7x - (2 + 2x) - 68$ 90) _____



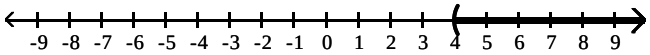
A) $[4, \infty)$



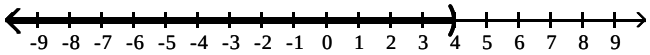
B) $(-\infty, 4]$



C) $(4, \infty)$



D) $(-\infty, 4)$



Solve the equation.

91) $x^2 - x = 6$ 91) _____

A) $\{-2, 3\}$ B) $\{-2, -3\}$ C) $\{1, 6\}$ D) $\{2, 3\}$

Express the radical in simplified form. Assume that all variables represent positive real numbers.

92) $-\sqrt[3]{125x^4y^5}$ 92) _____

A) $-5xy\sqrt[3]{xy^2}$ B) $5xy\sqrt[3]{xy^2}$ C) $-5xy\sqrt[3]{xy}$ D) $xy\sqrt[3]{xy^2}$

If the following defines a one–to–one function, find its inverse. If not, write "Not one–to–one."

93) $f(x) = x^3 - 9$ 93) _____

A) Not one–to–one B) $f^{-1}(x) = \pm\sqrt[3]{x + 9}$

C) $f^{-1}(x) = \sqrt[3]{x + 9}$ D) $f^{-1}(x) = x + 9$

Multiply or divide as indicated. Write the answer in lowest terms.

94) $\dfrac{2t^2 - 3t - 9}{3t^2 - 4t - 7} \cdot \dfrac{3t^2 + 11t - 42}{t^2 + 3t - 18}$ 94) _____

A) $\dfrac{(2t + 3)(t + 3)}{(t + 6)(3t - 7)}$ B) $\dfrac{2t + 3}{t - 1}$ C) $\dfrac{2t + 3}{t + 1}$ D) $\dfrac{(2t + 3)(t + 6)}{(t + 1)(t - 6)}$

95) $\dfrac{z^2 + 15z + 54}{z^2 + 17z + 72} \div \dfrac{z^2 + 6z}{z^2 + 18z + 80}$ 95) _____

A) $\dfrac{z + 10}{z^2 + 8z}$ B) $z + 10$ C) $\dfrac{z + 10}{z}$ D) $\dfrac{z}{z^2 + 17z + 72}$

Determine whether the relation defines y as a function of x. Give the domain.

96) $y^2 = 3x$ 96) _____

A) Function; domain: $(-\infty, \infty)$
B) Function; domain: $(-\infty, 0]$
C) Not a function; domain: $(-\infty, 0]$
D) Not a function; domain: $[0, \infty)$

97) $y = \sqrt{4x - 3}$ 97) _____

A) Not a function; domain: $\left(-\infty, \frac{3}{4}\right]$
B) Function; domain: $\left[\frac{3}{4}, \infty\right)$
C) Not a function; domain: $\left[\frac{3}{4}, \infty\right)$
D) Function; domain: $(-\infty, \infty)$

Find an equation of the line satisfying the conditions. Write the equation in slope –intercept form.

98) Through (–3, 8); perpendicular to $-3x + 4y = -23$ 98) _____

A) $y = -\frac{3}{4}x + \frac{23}{4}$
B) $y = \frac{4}{3}x + 12$
C) $y = -\frac{4}{3}x + 4$
D) $y = \frac{3}{4}x + \frac{41}{4}$

Use a formula to solve the problem.

99) A square plywood platform has a perimeter which is 6 times the length of a side, decreased by 14. Find the length of a side. 99) _____

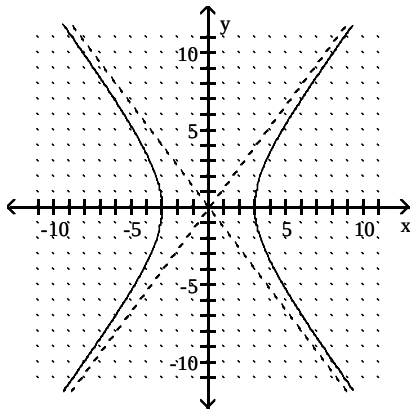
A) 1
B) 7
C) 2
D) 9

Multiply, then simplify the product. Assume that all variables represent positive real numbers.

100) $(3 - 2\sqrt{3})^2$ 100) _____

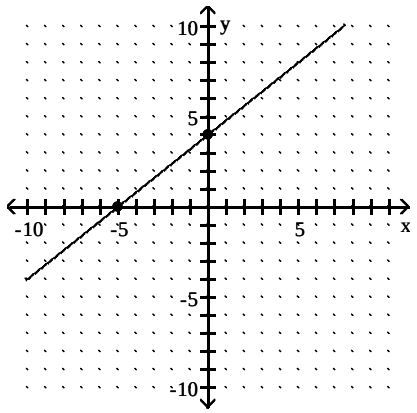
A) $21 + 12\sqrt{3}$
B) $9 + 4\sqrt{3}$
C) $21 - 12\sqrt{3}$
D) $9 - 4\sqrt{3}$

1)



2) B
3) A
4) C
5) A
6) A
7) D
8) C
9) C
10) D
11) D
12) C
13) B
14) D
15) C
16) B
17) D
18) D
19) D
20) D
21) C
22) B
23) C
24) C
25) A
26) A
27) D
28) A
29) A
30) A
31) A
32) B
33) C
34) C
35) A
36) B
37) A
38) B

39) A
40) C
41) A
42) C
43) B
44) C
45) C
46) A
47) B
48) D
49) C
50) D
51) D
52) C
53) B
54) (0, 4), (–5, 0)



55) B
56) D
57) D
58) A
59) C
60) B
61) B
62) C
63) C
64) D
65) D
66) C
67) C
68) D
69) A
70) A
71) A
72) B
73) C
74) D
75) B
76) C

77) A
78) A
79) D
80) A
81) C
82) D
83) A
84) D
85) B
86) A
87) C
88) C
89) C
90) B
91) A
92) A
93) C
94) C
95) C
96) D
97) B
98) C
99) B
100) C