Math 1010 - Intermediate Algebra
Practice Problems for the Final Exam

Perform the indicated operation.

1) $(8x - 3y)^2$ 1) _____

A) $64x^2 - 48xy + 9y^2$

B) $8x^2 + 9y^2$

C) $64x^2 + 9y^2$

D) $8x^2 - 48xy + 9y^2$

Find the midpoint of the segment with the given endpoints.

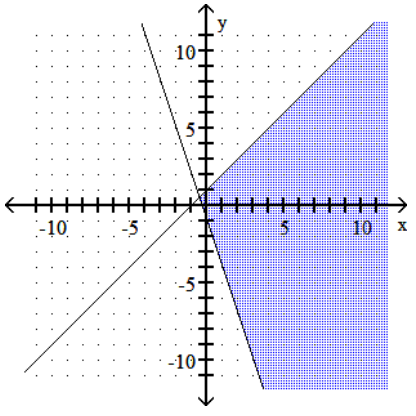
2) (2, -2) and (-1, 4) 2) _____

A) $\left(\frac{3}{2}, -3\right)$ B) $\left(\frac{1}{2}, 1\right)$ C) $(1, 2)$ D) $(3, -6)$

Graph the inequality or compound inequality.

3) $y \geq -3x - 1$ and $x - y \geq -1$ 3) _____

A)



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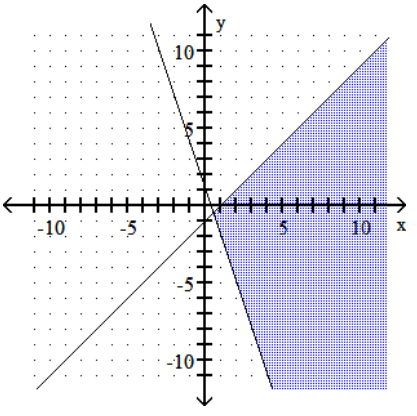

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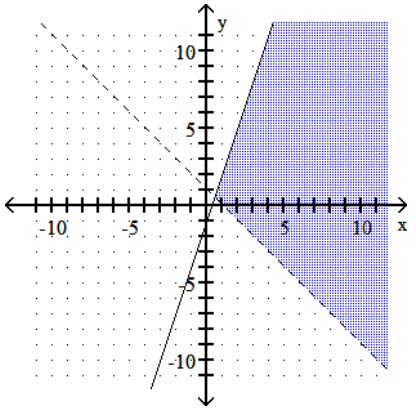

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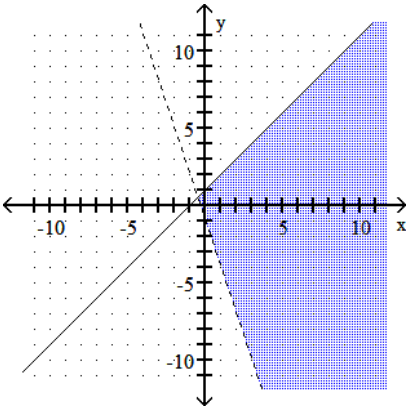


Solve the equation.

4) $4r^2 - 31r - 8 = 0$ 4) _____

A) $\left\{\frac{1}{31}, -\frac{1}{4}\right\}$ B) $\{-4, 8\}$ C) $\left\{-\frac{1}{4}, 4\right\}$ D) $\left\{-\frac{1}{4}, 8\right\}$

Evaluate the expression.

5) [[6.5]] 5) _____

A) 5 B) 7 C) -6 D) 6

Solve the investment problem.

6) Roberto invested some money at 8%, and then invested $4000 more than twice this amount at 11%. His total annual income from the two investments was $4940. How much was invested at 11%? 6) _____

A) $30,000 B) $3400 C) $34,000 D) $12,000

Solve the equation.

7) $\log_4 (x + 2) + \log_4 (x - 4) = 2$ 7) _____

A) $x = 6$ B) $x = 7$ C) $x = -4$ D) $x = 6, x = -4$

Simplify. Assume that all variables represent positive real numbers.

8) $(3 - 3\sqrt{3})^2$ 8) _____

A) $9 - 9\sqrt{3}$ B) $9 + 9\sqrt{3}$ C) $36 + 18\sqrt{3}$ D) $36 - 18\sqrt{3}$

Multiply or divide. Write the answer in lowest terms.

9) $\frac{3(p - 1)}{p} \div \frac{5(p - 1)}{2p^2}$ 9) _____

A) $\frac{6p}{5}$ B) $\frac{6p^3 - 6p^2}{5p^2 - 5p}$

C) $\frac{5}{6p}$ D) $\frac{15p^2 + 30p + 15}{2p^3}$

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

10) $|-8x + 8| + 1 < 6$ 10) _____

A) $\left(\frac{3}{8}, \frac{13}{8}\right)$ B) $\emptyset$

C) $\left(-\infty, \frac{3}{8}\right) \cup \left(\frac{13}{8}, \infty\right)$ D) $\left(-\infty, \frac{3}{8}\right)$

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

11) [(3 + 9i) - (8 + 3i)] - (8 - 8i) 11) _____

A) -13 + 4i B) 19 + 14i C) -13 + 14i D) 19 + 4i

Solve the problem.

12) A pension fund invests $92,600 in municipal bonds and earns 6% per year on the investment. How much money is earned per year? 12) _____

A) $154,333 B) $55,560 C) $5556 D) $1,543,333

Simplify. Assume that all variables represent positive real numbers.

13) $\sqrt{150} - 4\sqrt{96} - 6\sqrt{54}$ 13) _____

A) $29\sqrt{6}$ B) $-96\sqrt{6}$ C) $54\sqrt{6}$ D) $-29\sqrt{6}$

Solve the equation. Give the exact solution.

14) $5^x = \frac{1}{25}$ 14) _____

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

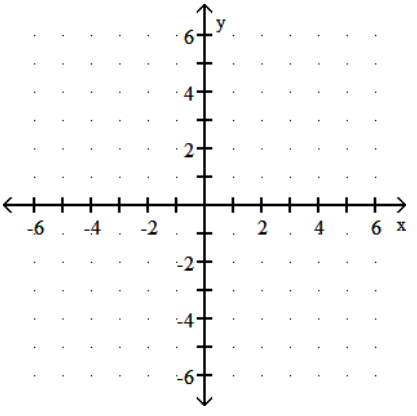
Solve the problem.

15) A ladder is resting against a wall. The top of the ladder touches the wall at a height of 12 ft. Find the length of the ladder if the length is 4 ft more than its distance from the wall. 15) _____

A) 20 ft B) 16 ft C) 24 ft D) 12 ft

Graph the given logarithmic function.

16) $y = \log_{1/7} x$ 16) _____



Solve the problem.

17) Find the measure of an angle, if its supplement measures 44° more than twice its complement. 17) _____

A) 88° B) 54° C) 44° D) 46°

Add or subtract. Write the answer in lowest terms.

18) $\frac{5x}{x+6} + \frac{3}{x-6}$ 18) _____

A) $\frac{5x+3}{(x+6)(x-6)}$ B) $\frac{5x^2 - 27x - 18}{(x+6)(x-6)}$ C) $\frac{5x^2 - 27x + 18}{(x+6)(x-6)}$ D) $\frac{5x+3}{x+6}$

Solve the problem.

19) From a point on a straight road, two cars are driven in opposite directions, one at 40 miles per hour and the other at 71 miles per hour. In how many hours will they be 333 miles apart? 19) _____

A) 3 hours B) 2 hours

C) Not enough information D) 4 hours

Simplify.

20) i^5 20) _____

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

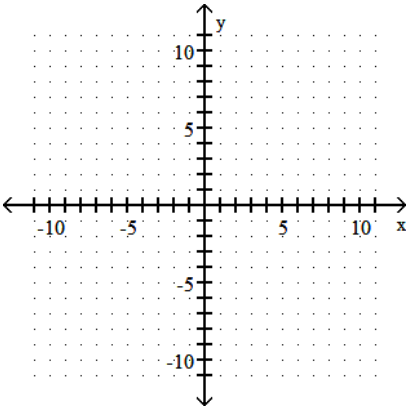
Solve the compound inequality.

21) $-5 \le 6x - 5$ and $2x + 2 < 10$ 21) _____

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

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

22) $x = (y + 3)^2 - 2$ 22) _____



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

23) $f(x) = 8x - 4$ 23) _____

A) Not one-to-one B) $f^{-1}(x) = \frac{x + 4}{8}$

C) $f^{-1}(x) = \frac{x}{8} + 4$ D) $f^{-1}(x) = \frac{x - 4}{8}$

Solve the compound inequality.

24) $-4x \le -12$ or $9x - 6 < 3x$ 24) _____

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

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

25) (7, -5) and (5, -2) 25) _____

A) 12x + 7y = -74 B) 3x + 2y = 11 C) -3x + 2y = 11 D) -12x - 7y = -74

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

26) $f(x) = 10x^2 + 8$ 26) _____

A) Not one-to-one B) $f^{-1}(x) = \sqrt{\frac{x - 8}{10}}$

C) $f^{-1}(x) = \frac{x - 8}{10}$ D) $f^{-1}(x) = \pm\sqrt{\frac{x - 8}{10}}$

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

27) $(-216)^{-2/3}$ 27) _____

A) -36 B) $\frac{1}{36}$ C) 36 D) $-\frac{1}{36}$

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

28) A rock falls from a tower that is 73.5 m high. As it is falling, its height is given by the formula $h = 73.5 - 4.9t^2$. How many seconds will it take for the rock to hit the ground (h=0)? 28) _____

A) 1102.5 sec B) 3.9 sec C) 8.3 sec D) 8.6 sec

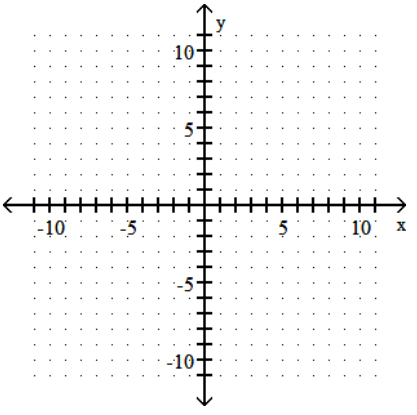
Simplify the expression. Assume that all variables represent positive real numbers.

29) $\frac{5^{3/4}x^{-2/3}y^{3/2}}{5^{-5/4}x^{7/3}y^{1/4}}$ 29) _____

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

Graph the compound inequality.

30) $2x + y < 6$ or $3x - 2y > 5$ 30) _____



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

31) Through (5, -10); horizontal 31) _____

A) (a) not possible
(b) $x = 5$

B) (a) $y = -10$
(b) $y = -10$

C) (a) not possible
(b) $x = 10$

D) (a) $y = -5$
(b) $y = -5$

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

32) Through (7, 2) and (-1, -7) 32) _____

A) $y = -\frac{5}{6}x - \frac{37}{6}$ B) $y = \frac{9}{8}x - \frac{47}{8}$ C) $y = -\frac{9}{8}x - \frac{47}{8}$ D) $y = \frac{5}{6}x - \frac{37}{6}$

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

33) $\frac{x^2 - 81}{x^2 - 7x + 12}$ 33) _____

A) $x \neq 0$ B) $x \neq 9, x \neq -9$ C) $x \neq -3, x \neq -4$ D) $x \neq 3, x \neq 4$

Use a formula to solve the problem.

34) A square plywood platform has a perimeter which is 8 times the length of a side, decreased by 12. Find the length of a side. 34) _____

A) 1 B) 3 C) 4 D) 7

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

35) $x^4 - 16$ 35) _____

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

C) $(x^2 + 4)(x + 2)(x - 2)$ D) Prime

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

36) $(2 - 3\sqrt{2})^2$ 36) _____

A) $22 + 12\sqrt{2}$ B) $4 + 9\sqrt{2}$ C) $22 - 12\sqrt{2}$ D) $4 - 9\sqrt{2}$

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

37) $x^2 + 36$ 37) _____

A) $(x + 6)^2$ B) $(x + 6)(x - 6)$ C) $(x - 6)^2$ D) Prime

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

38) $y = \sqrt{2x - 7}$ 38) _____

A) Not a function; domain: $\left(-\infty, \frac{7}{2}\right]$ B) Function; domain: $\left[\frac{7}{2}, \infty\right)$

C) Not a function; domain: $\left[\frac{7}{2}, \infty\right)$ D) Function; domain: $(-\infty, \infty)$

Perform the indicated operation. Give answer in standard form.

39) $(5 + 6i)(4 + 8i)$ 39) _____

A) $68 - 16i$ B) $48i^2 + 64i + 20$ C) $-28 + 64i$ D) $-28 - 64i$

Write the rational expression in lowest terms.

40) $\frac{y^2 + 2y - 24}{y^2 - 2y - 48}$ 40) _____

A) $-\frac{y^2 + 2y - 24}{y^2 - 2y - 48}$ B) $\frac{2y - 24}{-2y - 48}$ C) $\frac{2y - 1}{-2y - 2}$ D) $\frac{y - 4}{y - 8}$

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

41) Let $f(x) = 2x^2 - 3x + 3$ and $g(x) = x - 1$; $(f \circ g)(x)$. 41) _____

A) $2x^2 - 7x + 2$ B) $2x^2 + 3x + 2$ C) $2x^2 - 7x + 8$ D) $-7x^2 + 2x + 8$

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

42) Through $(-3, 8)$; perpendicular to $-3x + 4y = -23$ 42) _____

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

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

43) $x + 3y = 23$
$5x + 2y = -2$ 43) _____

A) {(4, 10)}
B) {(-4, 9)}
C) {(-5, 10)}
D) ∅; inconsistent system

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

44) (6, - 16)
$y + 2x = -4$
$x + y = -10$ 44) _____

A) Yes
B) No

For the polynomial function, find the requested value.

45) $f(x) = 8x + 8$; $f(2)$ 45) _____

A) 8
B) 32
C) 16
D) 24

Find the slope of the line.

46) $x = -10$ 46) _____

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

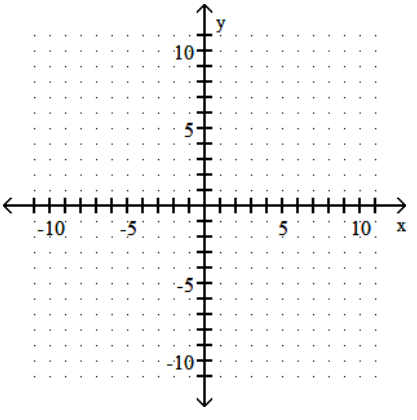
Evaluate.

47) $\sqrt[3]{-64}$ 47) _____

A) -16
B) 6i
C) -4
D) 4

Graph the linear equation. Give the x- and y-intercepts.

48) $2x + y = -4$ 48) _____



Write the expression in the form a + bi.

49) $\frac{6 + 2i}{9 - 3i}$ 49) _____

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) $\frac{14}{15}$

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

50) $-\sqrt[3]{64x^4y^5}$ 50) _____

A) $-4xy\sqrt[3]{xy^2}$ B) $4xy\sqrt[3]{xy^2}$ C) $-4xy\sqrt[3]{xy}$ D) $xy\sqrt[3]{xy^2}$

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

51) $x - 4y = 1$ 51) _____
$x = 4 + 4y$

A) {(1, 4)} B) {(1, 0)}

C) $\{(x, y) \mid x - 4y = 1\}$; dependent equations D) $\emptyset$; inconsistent system

Solve, giving the correct solution to four decimal places. (Hint: Use logarithms.)

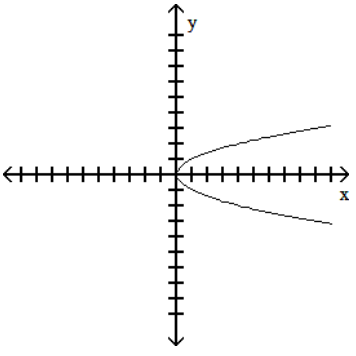
52) $14^x = 22$ 52) _____

A) {0.8500} B) {1.4520} C) {1.1713} D) {1.5714}

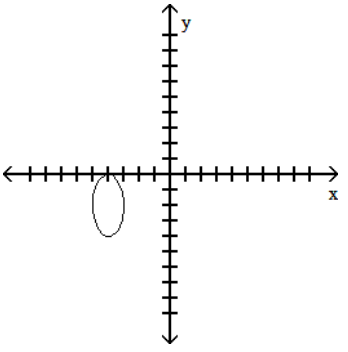
Provide an appropriate response.

53) Which one of the following is the graph of a function? 53) _____

A)



B)



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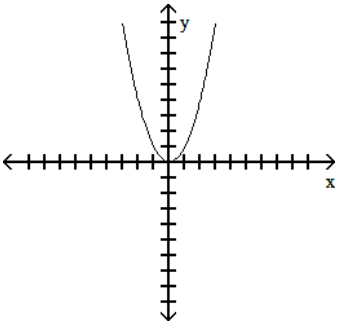
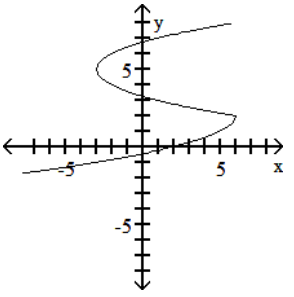


D)



Write the number in scientific notation.

54) The earth is approximately 92,900,000 miles from the sun. 54) _____

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

Evaluate the composition of functions.

55) Let $f(x) = 7x + 4$ and $g(x) = x + 8$. Find $(f \circ g)(3)$. 55) _____

A) 33 B) 36 C) 275 D) 81

Evaluate the expression.

56) $4^{-1} + 3^{-1}$ 56) _____

A) $\frac{12}{7}$ B) 1 C) $\frac{7}{12}$ D) 2

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

57) $\frac{2t^2 - 5t - 12}{3t^2 - 3t - 6} \cdot \frac{3t^2 + 12t - 36}{t^2 + 2t - 24}$ 57) _____

A) $\frac{(2t + 3)(t + 4)}{(t + 6)(3t - 6)}$ B) $\frac{2t + 3}{t - 1}$ C) $\frac{2t + 3}{t + 1}$ D) $\frac{(2t + 3)(t + 6)}{(t + 1)(t - 6)}$

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

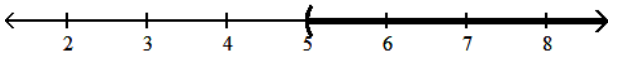
58) $\frac{(x^{-6})^{-6}(x^{-1}y)^3}{(xy^{-6})^3}$ 58) _____

A) $x^{36}y^{21}$ B) $x^{34}y^3$ C) $x^{108}y^{-15}$ D) $x^{30}y^{21}$

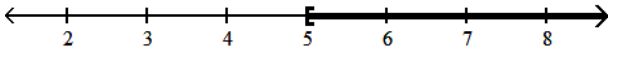
Solve the inequality. Write the solution set in interval notation and graph it.

59) $6x - 6 > 2(2x + 2)$ 59) _____

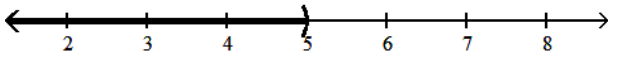
A) $(5, \infty)$



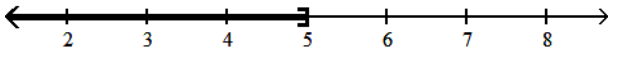
B) $[5, \infty)$



C) $(-\infty, 5)$



D) $(-\infty, 5]$



Find the vertex of the parabola.

60) $f(x) = 4x^2 - 32x + 61$ 60) _____

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

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

61) $\frac{z^2 + 13z + 36}{z^2 + 17z + 72} \div \frac{z^2 + 4z}{z^2 + 14z + 48}$ 61) _____

A) $\frac{z + 6}{z^2 + 8z}$ B) $z + 6$ C) $\frac{z + 6}{z}$ D) $\frac{z}{z^2 + 17z + 72}$

Solve by using the square root property.

62) $(9x + 9)^2 = 49$ 62) _____

A) $\left\{-\frac{2}{9}, -\frac{16}{9}\right\}$ B) $\left\{-\frac{2}{9}, 0\right\}$ C) $\left\{\frac{2}{9}, \frac{16}{9}\right\}$ D) $\left\{\frac{40}{9}\right\}$

Solve the problem.

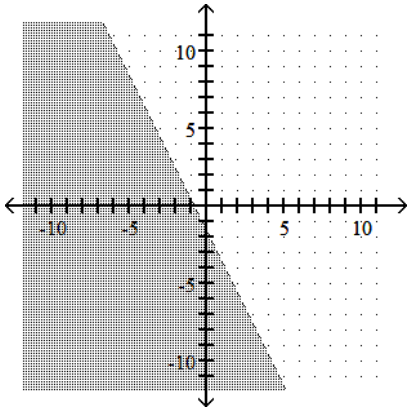
63) A woman has $1.70 in dimes and nickels. She has 5 more dimes than nickels. How many nickels does she have? 63) _____

A) 8 nickels B) 3 nickels C) 18 nickels D) 13 nickels

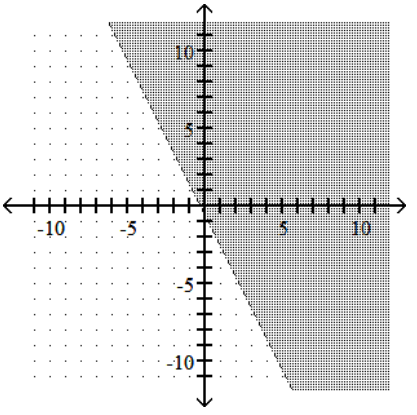
Graph the inequality or compound inequality.

64) $6x + 3y > -2$ 64) _____

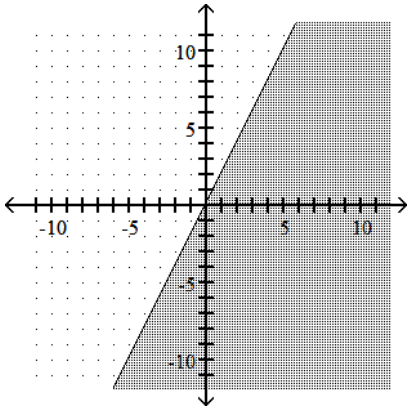
A)



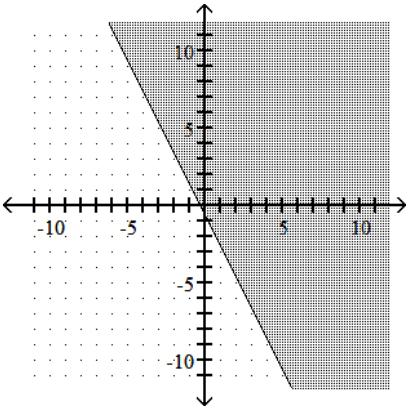
B)



C)



D)



Solve the equation.

65) $\frac{1}{x - 1} + \frac{4}{2x - 2} = 3$ 65) _____

A) {2} B) {0} C) {1} D) {12}

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

66) $y^2 = 5x$ 66) _____

A) Function; domain: $(-\infty, 0]$ B) Function; domain: $(-\infty, \infty)$

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

Solve the problem.

67) A plane flies 410 miles with the wind and 350 miles against the wind in the same length of time. If the speed of the wind is 30 mph, what is the speed of the plane in still air? 67) _____

A) 370 mph B) 405 mph C) 385 mph D) 380 mph

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

68) $c^2 + d^2 + f^2 = g^2$, for c 68) _____

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

C) $c = g - d - f$ D) $c = -g + d + f$

Solve the equation.

69) $x^2 - x = 56$ 69) _____

A) {-7, 8} B) {7, 8} C) {-7, -8} D) {1, 56}

Simplify. Assume that all variables represent positive real numbers.

70) $\dfrac{-33}{\sqrt{13}+\sqrt{2}}$ 70) _____

A) $3(\sqrt{13} - \sqrt{2})$ B) $-(\sqrt{13} - \sqrt{2})$ C) $-3(\sqrt{13} - \sqrt{2})$ D) $-3(\sqrt{13} + \sqrt{2})$

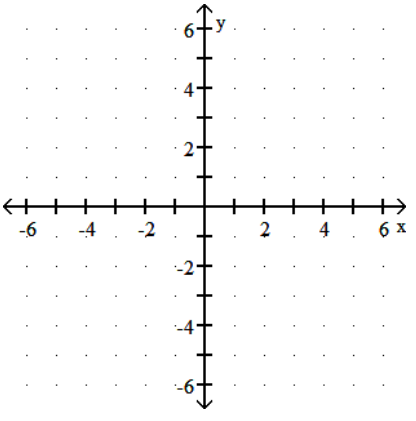
Solve the equation.

71) $36x^4 - 85x^2 + 49 = 0$ 71) _____

A) $\left\{-1, -\frac{6}{7}\right\}$ B) $\left\{-1, -\frac{6}{7}, \frac{6}{7}, 1\right\}$ C) $\left\{1, \frac{7}{6}\right\}$ D) $\left\{-\frac{7}{6}, -1, 1, \frac{7}{6}\right\}$

Graph the linear equation. Give the x- and y-intercepts.

72) $x + 4 = 0$ 72) _____



Solve the equation.

73) $\dfrac{-4}{m-4} - \dfrac{4}{m+4} = \dfrac{8}{m^2 - 16}$ 73) _____

A) {1} B) {-1, 1} C) {-1} D) ∅

Solve the problem.

74) Thompson's Hardware spent $44,820 this year on utility costs alone. If total sales were $432,000, what percent of total sales was spent on utility costs? Round to the nearest tenth of a percent, if necessary. 74) _____

A) 9.6% B) 96% C) 1% D) 10.4%

Solve the equation.

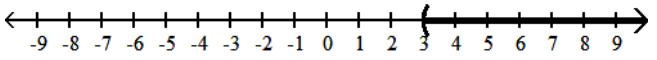
75) $\frac{2x - 5}{5} = \frac{4x + 2}{4}$ 75) _____

A) $-\frac{5}{14}$ B) $-\frac{5}{2}$ C) $\frac{5}{6}$ D) $\frac{15}{14}$

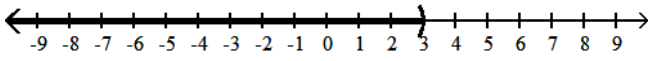
Solve the inequality and graph the solution set.

76) $-3x + 5(x - 2) \geq 7x - (5 + 2x) - 14$ 76) _____

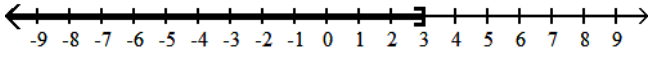
A) $(3, \infty)$



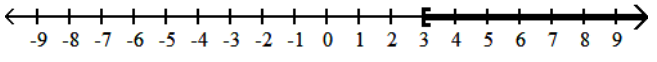
B) $(-\infty, 3)$



C) $(-\infty, 3]$



D) $[3, \infty)$



Solve the equation.

77) $\frac{2}{3x} - \frac{3}{x + 3} = 1$ 77) _____

A) $\left\{\frac{8 + \sqrt{82}}{3}, \frac{8 - \sqrt{82}}{3}\right\}$ B) $\emptyset$

C) $\left\{\frac{-8 + \sqrt{82}}{3}, \frac{-8 - \sqrt{82}}{3}\right\}$ D) $\left\{\frac{-10 + \sqrt{82}}{3}, \frac{-10 - \sqrt{82}}{3}\right\}$

Solve the problem.

78) Mardi received an inheritance of $70,000. She invested part at 7% and deposited the remainder in tax-free bonds at 8%. Her total annual income from the investments was $5200. Find the amount invested at 7%. 78) _____

A) $20,000 B) $39,000 C) $40,000 D) $64,800

Solve the equation.

79) $4 - (x - 2) = -5x + 4(x + 4)$ 79) _____

A) $\left\{\frac{10}{0}\text{v}\right\}$ B) $\{5\}$

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

Solve the problem.

80) In the previous baseball season, team A won the most games of any major league team. Team A won 9 less than twice as many games as they lost. They played 162 regular-season games. How many wins and losses did team A have? 80) _____

A) Wins: 105; losses: 58 B) Wins: 106; losses: 56

C) Wins: 103; losses: 59 D) Wins: 105; losses: 57

Solve the equation.

81) $\frac{x}{14} + \frac{4}{7} = \frac{x - 6}{7}$ 81) _____

A) {20 } B) {14 } C) {10 } D) {16 }

Solve the problem.

82) A plane flies 440 miles with the wind and 320 miles against the wind in the same length of time. If the speed of the wind is 30 mph, what is the speed of the plane in still air? 82) _____

A) 190 mph B) 180 mph C) 195 mph D) 215 mph

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

83) $f(x) = x^3 - 10$ 83) _____

A) Not one-to-one B) $f^{-1}(x) = x + 10$

C) $f^{-1}(x) = \sqrt[3]{x + 10}$ D) $f^{-1}(x) = \pm\sqrt[3]{x + 10}$

Use the quadratic formula to solve the equation.

84) $7x^2 - 3x + 4 = 0$ 84) _____

A) $\left\{\frac{3 + i\sqrt{103}}{14}, \frac{3 - i\sqrt{103}}{14}\right\}$ B) $\left\{\frac{-3 + i\sqrt{103}}{14}, \frac{-3 - i\sqrt{103}}{14}\right\}$

C) $\left\{\frac{3 + \sqrt{103}}{14}, \frac{3 - \sqrt{103}}{14}\right\}$ D) $\left\{\frac{-3 + \sqrt{103}}{14}, \frac{-3 - \sqrt{103}}{14}\right\}$

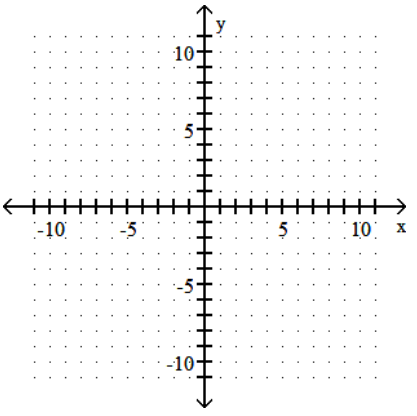
Solve the problem.

85) Jill is 22.5 km away from Joe. Both begin to walk toward each other at the same time. Jill walks at 1.5 km per hour. If they meet in 5 hours, how fast is Joe walking? 85) _____

A) 3 km per hour B) 4 km per hour C) 1.5 km per hour D) 5 km per hour

Sketch the graph of the parabola.

86) $y = 2x^2 - 8x + 7$ 86) _____



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

87) $12y^4 - 42y^3 - 24y^2$ 87) _____

A) $6y^2(2y + 1)(y - 4)$ B) $y^2(12y - 6)(y + 4)$

C) $6y^2(2y - 1)(y + 4)$ D) Prime

Solve the equation.

88) $5x + \sqrt{x + 42} = 7 + 3x$ 88) _____

A) $\{\frac{1}{4}\}$ B) {49} C) $\{-7, -\frac{1}{4}\}$ D) $\{7, \frac{1}{4}\}$

Solve the problem.

89) How many liters of a 10% alcohol solution must be mixed with 40 liters of a 60% solution to get a 30% solution? 89) _____

A) 60 L B) 100 L C) 6 L D) 10 L

Perform the indicated operation and express in lowest terms.

90) $\frac{z^2 + 10z + 21}{z^2 + 12z + 35} \div \frac{z^2 + 3z}{z^2 - 2z - 35}$ 90) _____

A) $\frac{z}{z^2 + 12z + 35}$ B) $z - 7$ C) $\frac{z - 7}{z}$ D) $\frac{z - 7}{z^2 + 5z}$

Solve the equation.

91) $6x + 7(3x - 2) = 16 - 3x$ 91) _____

A) $\left\{\frac{1}{12}\right\}$ B) {-1} C) $\left\{\frac{1}{15}\right\}$ D) {1}

Solve the equation. Give the exact solution or solutions.

92) $\log(x + 4) = \log(2x - 5)$ 92) _____

A) {0} B) $\varnothing$ C) {-9} D) {9}

Perform the indicated operations.

93) $\frac{30x^3 + 40x^2 - 15x + 4}{5x}$ 93) _____

A) $6x^2 + 40x - 15 + \frac{4}{x}$

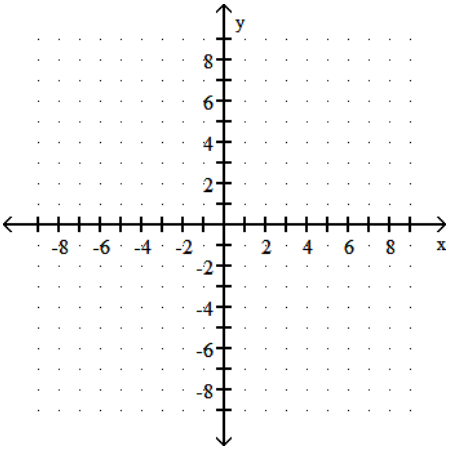
B) $6x^3 + 8x^2 - 3x + \frac{4}{5}$

C) $6x^2 + 8x - 3 + \frac{4}{5x}$

D) $6x^2 + 8x - 3 + \frac{4}{x}$

Graph the function. Give the domain and range.

94) $f(x) = |x + 1|$ 94) _____



Solve the problem.

95) Martha can rake the leaves in her yard in 2 hours. Her younger brother can do the job in 3 hours. How long will it take them to do the job if they work together? 95) _____

A) $\frac{6}{5}$ hr B) $\frac{5}{6}$ hr C) 3 hr D) 6 hr

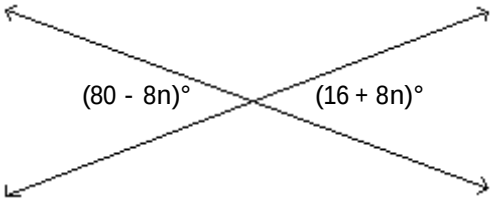
Solve the equation.

96) $\sqrt{2x - 4} - 10 = 0$ 96) _____

A) {52} B) ∅ C) {7} D) {100}

Solve the problem.

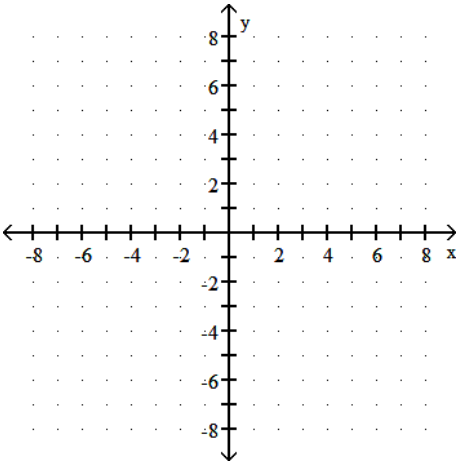
97) Find the measures of the vertical angles. 97) _____



A) 80°, 80° B) 48°, 48° C) 16°, 16° D) 4°, 4°

Graph the function. Give the equations of its vertical and horizontal asymptotes.

98) $f(x) = \frac{1}{x - 3}$ 98) _____



Solve the equation by factoring.

99) $5x^2 - 7x = 0$ 99) _____

A) $\left\{1, \frac{5}{7}\right\}$ B) $\left\{0, \frac{7}{5}\right\}$ C) $\left\{\frac{7}{5}\right\}$ D) {0, 7}

Solve the system by graphing.

100) $6x + y = -32$
$x + 6y = 18$ 100) _____

A) {(6, 4)} B) {(-5, -2)} C) {(-6, 4)} D) {(-6, -7)}

Simplify. Assume that all variables represent positive real numbers.

101) $4\sqrt{5} + 9\sqrt{125}$ 101) _____

A) $-49\sqrt{5}$ B) $41\sqrt{5}$ C) $13\sqrt{5}$ D) $49\sqrt{5}$

Solve the problem.

102) A rectangular Persian carpet has a perimeter of 184 inches. The length of the carpet is 18 in. more than the width. What are the dimensions of the carpet? 102) _____

A) Width: 37 in.; length: 55 in.
B) Width: 83 in.; length: 101 in.
C) Width: 55 in.; length: 73 in.
D) Width: 74 in.; length: 92 in.

Perform the indicated operations. (Hint: Use long division.)

103) $(2x^3 - 5x^2 - 7x - 12) \div (x - 4)$ 103) _____

A) $2x^2 - x + 7 + \frac{7}{x - 4}$ B) $2x^2 + 3x + 5$

C) $2x^3 + 3x + \frac{8}{x - 4}$ D) $2x^2 + 3x + 5 + \frac{8}{x - 4}$

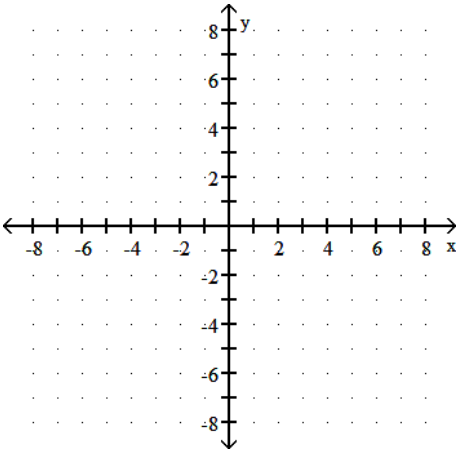
Evaluate the expression.

104) -11^0 104) _____

A) -11 B) -1 C) 0 D) 1

Graph the step function.

105) $f(x) = [\![x - 5]\!]$ 105) _____



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

106) $f(x) = 10x^2 + 17x + 6$ and $g(x) = 2x^2 + 14x - 7$; $(f - g)(x)$ 106) _____

A) $8x^4 + 3x^2 + 13$ B) $8x^2 + 3x + 13$ C) $8x^2 - 3x - 13$ D) $8x^2 + 3x - 1$

Solve the problem involving consecutive integers.

107) If the first and third of three consecutive odd integers are added, the result is 45 less than five times the second integer. Find the third integer. 107) _____

A) 17 B) 30 C) 13 D) 15

Factor.

108) $y^3 - 343$ 108) _____

A) $(y - 7)(y + 7)^2$ B) $(y - 7)^3$

C) $(y + 7)(y^2 - 7y - 49)$ D) $(y - 7)(y^2 + 7y + 49)$

Simplify the complex fraction.

109) $\dfrac{a^{-2} - b^{-1}}{8a^{-1} + 3b^{-2}}$ 109) _____

A) $\dfrac{ab^2 - a^2}{8b^2 + 3a^2b}$ B) $\dfrac{b^2 - a^2}{8ab^2 + 3a^2}$ C) $\dfrac{b^2 - a^2b}{8ab^2 + 3a^2}$ D) $\dfrac{b^2 - a^2b}{8b^2 + 3a^2}$

Find the distance between the points.

110) (-3, 8) and (1, 5) 110) _____

A) -5 B) 5 C) 10 D) $\sqrt{5}$

Solve for the indicated variable.

111) $A = \frac{h(B + b)}{2}$ for B

111) _____

A) $B = \frac{A - bh}{h}$ B) $B = \frac{2A + bh}{h}$ C) $B = \frac{2A - bh}{h}$ D) $B = 2A - bh$

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

112) $\left(\frac{x^{-7}y^{-3}}{x^{-4}y^{5}}\right)^{-3/5}$

112) _____

A) $x^{33/5}y^{24/5}$ B) $x^{84/5}y^{24/5}$ C) $x^{9/5}y^{24/5}$ D) $x^{9/5}y^{9}$

Perform the indicated operation. Give answer in standard form.

113) $(-5 + 2i) - (6 + 3i) - 11i$

113) _____

A) $-11 - 6i$ B) $-11 + 12i$ C) $11 - 12i$ D) $-11 - 12i$

Solve the equation.

114) $7(x + 7) = (7x + 49)$

114) _____

A) {All real numbers} B) {0}

C) $\varnothing$ D) {98}

Solve the equation. Give the exact solution.

115) $3^x = \frac{1}{81}$

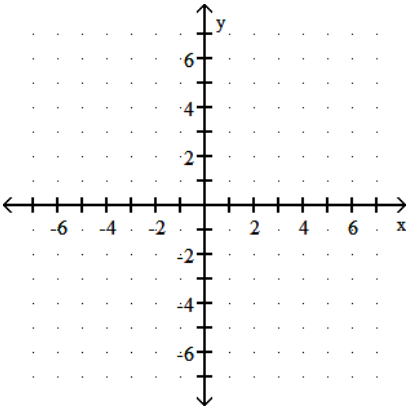
115) _____

A) $\{-4\}$ B) $\{4\}$ C) $\left\{\frac{1}{4}\right\}$ D) $\left\{\frac{1}{27}\right\}$

Graph the function.

116) $f(x) = 4^x$

116) _____



Solve the equation.

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

117) _____

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

Factor the polynomial completely.

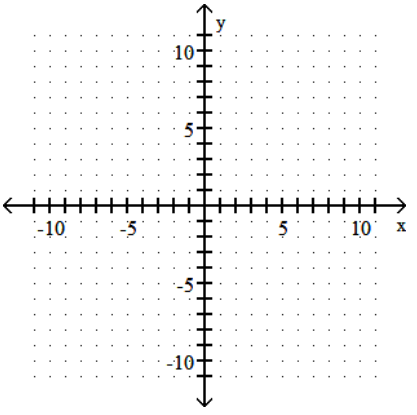
118) $49x^2 - 16$ 118) _____

A) $(49x + 1)(x - 16)$ B) $(7x - 4)^2$

C) $(7x + 4)(7x - 4)$ D) $(7x + 4)^2$

Graph the function and give its domain and its range.

119) $f(x) = \sqrt{x - 4}$ 119) _____



Use properties of logarithms to write each expression as a single logarithm. Assume that variables represent positive real numbers, with base $\neq 1$.

120) $5 \log_b t - \frac{2}{5}\log_b s + \frac{1}{2}\log_b v - 2\log_b u$ 120) _____

A) $\log_b \frac{t^5 u^2}{v^{1/2} s^{2/5}}$ B) $\log_b \frac{t^5 s^{2/5}}{v^{1/2} u^2}$

C) $\log_b (5t - \frac{2}{5}s + \frac{1}{2}v - 2u)$ D) $\log_b \frac{t^5 v^{1/2}}{s^{2/5} u^2}$

Add or subtract as indicated. Write the answer in lowest terms.

121) $\frac{7}{x + 4} + \frac{4}{x^2 - 4x + 16} - \frac{336}{x^3 + 64}$ 121) _____

A) $-\frac{1}{x^2 - 16}$ B) $\frac{9x - 56}{x + 4}$ C) $\frac{7x - 52}{x^3 - 64}$ D) $\frac{7x - 52}{x^2 - 4x + 16}$

Simplify the complex fraction.

122) $\frac{\frac{25s^2 - 49t^2}{st}}{\frac{5}{t} - \frac{7}{s}}$ 122) _____

A) $7s + 5t$ B) $\frac{7s + 5t}{st}$ C) $5s + 7t$ D) $\frac{st}{5s + 7t}$

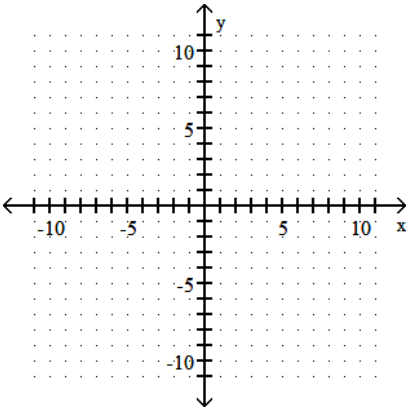
Evaluate the expression.

123) $[[-20.7]]$ 123) _____

A) -20 B) -19 C) -8 D) -21

Graph the function.

124) $f(x) = |x - 3| - 4$ 124) _____



Simplify the complex fraction.

125) $\dfrac{a^{-2} - b^{-1}}{6a^{-1} + 5b^{-2}}$ 125) _____

A) $\dfrac{b^2 - a^2}{6ab^2 + 5a^2}$ B) $\dfrac{b^2 - a^2b}{6ab^2 + 5a^2}$ C) $\dfrac{b^2 - a^2b}{6b^2 + 5a^2}$ D) $\dfrac{ab^2 - a^2}{6b^2 + 5a^2b}$