

Name _____

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

For questions 1-9: Solve.

1) $-2z + 7 = -3z + 12$ 1) _____
 A) 12 B) -12 C) -7 D) 5

2) $4(x + 5) - (3x + 4) = -4$ 2) _____
 A) $x = -20$ B) $x = 12$ C) $x = 5$ D) $x = 20$

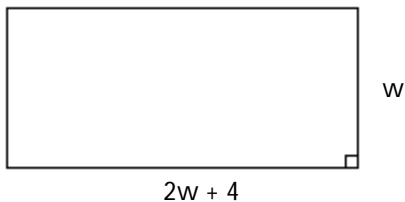
3) $\frac{2}{5}x - \frac{1}{3}x = 3$ 3) _____
 A) $x = -90$ B) $x = 45$ C) $x = 90$ D) $x = -45$

4) $\frac{1}{5}(x + 6) = \frac{1}{6}(x + 8)$ 4) _____
 A) $x = -12$ B) $x = 3$ C) $x = -4$ D) $x = 4$

5) $-2(x - 3) - 59 = 3x - 5(x + 7)$ 5) _____
 A) -24 B) -94
 C) all real numbers D) no solution

6) $3(x + 7) = (3x + 21)$ 6) _____
 A) 0 B) 42
 C) all real numbers D) no solution

7) The length of a rectangular room is 4 feet longer than twice the width. If the room's perimeter is 176 feet, what are the room's dimensions? 7) _____



- A) Width = 56 ft; length = 120 ft B) Width = 28 ft; length = 60 ft
 C) Width = 42 ft; length = 46 ft D) Width = 33 ft; length = 70 ft

8) Four times the sum of some number and 3 is equal to 7 times the number minus 12. 8) _____
 A) 24 B) 8 C) -24 D) -8

9) A 12-ft. board is cut into 2 pieces so that one piece is 8 feet longer than 3 times the shorter piece. If the shorter piece is x feet long, find the lengths of both pieces. 9) _____
 A) shorter piece: 28 ft; longer piece: 36 ft B) shorter piece: 24 ft; longer piece: 44 ft
 C) shorter piece: 1 ft; longer piece: 11 ft D) shorter piece: 6 ft; longer piece: 36 ft

For questions 10-11: Solve the equation for the indicated variable.

10) $P = 2L + 2W$ for L

A) $L = d - 2W$

B) $L = P - W$

C) $L = \frac{P - W}{2}$

D) $L = \frac{P - 2W}{2}$

10) _____

11) $A = P + PRT$ for T

A) $T = \frac{PR}{A - P}$

B) $T = \frac{P - A}{PR}$

C) $T = \frac{A}{R}$

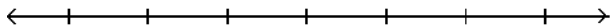
D) $T = \frac{A - P}{PR}$

11) _____

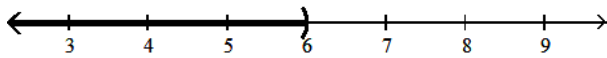
For questions 12-13: Solve the inequality. Graph the solution set and write it in interval notation.

12) $18x - 21 \leq 3(5x - 1)$

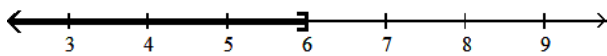
12) _____



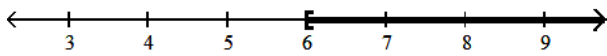
A) $x < 6$



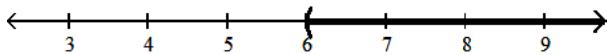
B) $x \leq 6$



C) $x \geq 6$



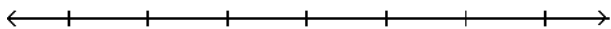
D) $x > 6$



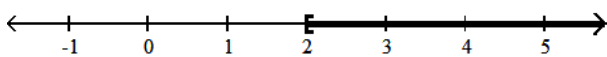
Solve the inequality. Graph the solution set and write it in interval notation.

13) $-8x + 8 \leq -2(3x - 2)$

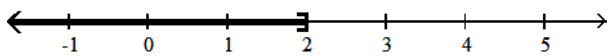
13) _____



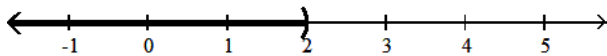
A) $x \geq 2$



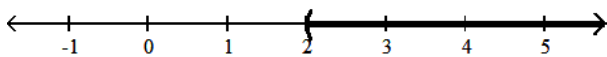
B) $x \leq 2$



C) $x < 2$



D) $x > 2$



For questions 14-15: Describe the situation with a linear inequality and then solve the inequality.

14) When making a long distance call from a certain pay phone, the first three minutes of a call cost \$1.10. After that, each additional minute or portion of a minute of that call costs \$0.15. Use an inequality to find the number of minutes one can call long distance for \$2.90.

14) _____

- A) at most 12 minutes
- B) at most 15 minutes
- C) at most 3 minutes
- D) at most 19 minutes

15) A certain store has a fax machine available for use by its customers. The store charges \$1.25 to send the first page and \$0.40 for each subsequent page. Use an inequality to find the number of pages that can be faxed for \$4.85

15) _____

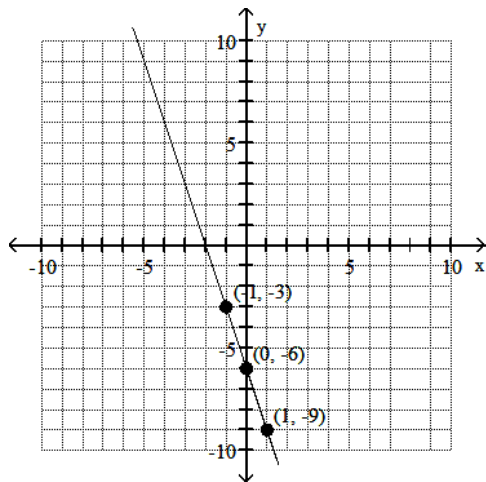
- A) at most 13 pages
- B) at most 10 pages
- C) at most 4 pages
- D) at most 35 pages

Graph the equation.

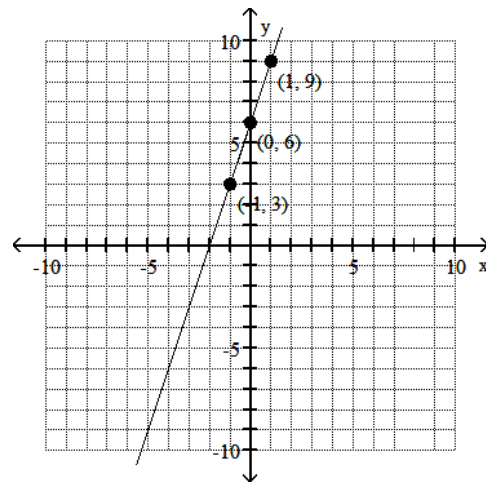
16) $y = 3x - 6$

16) _____

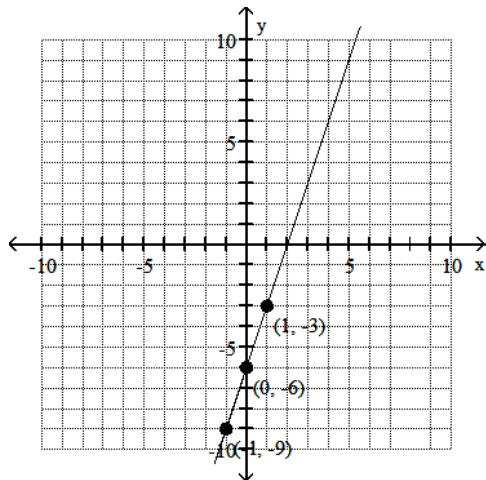
A)



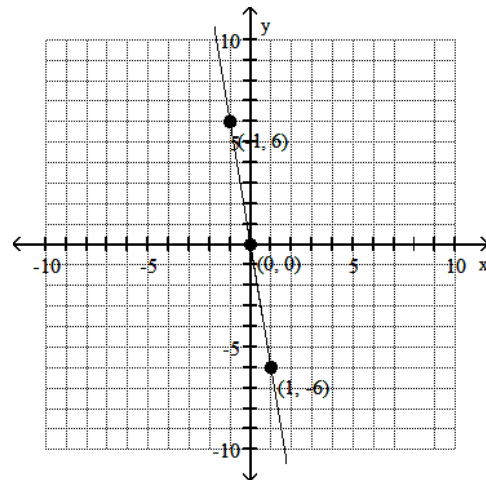
B)



C)



D)

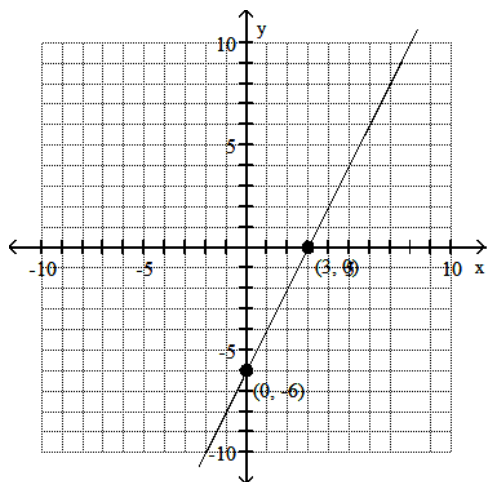


For questions 17-18: Graph the equation by plotting the intercepts.

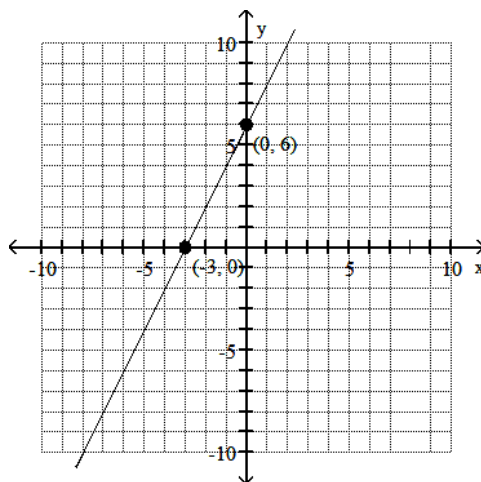
17) $4x - 8y = 24$

17) _____

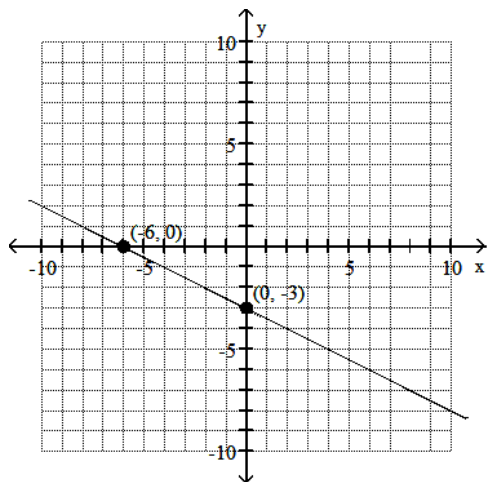
A)



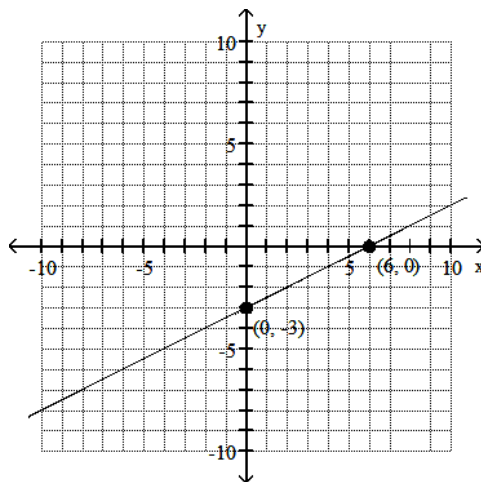
B)



C)



D)

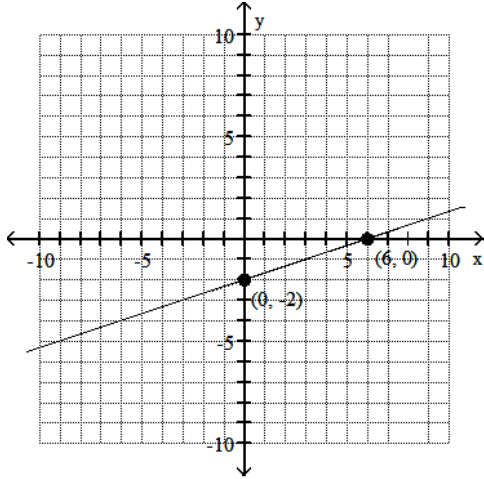


Graph the equation by plotting the intercepts.

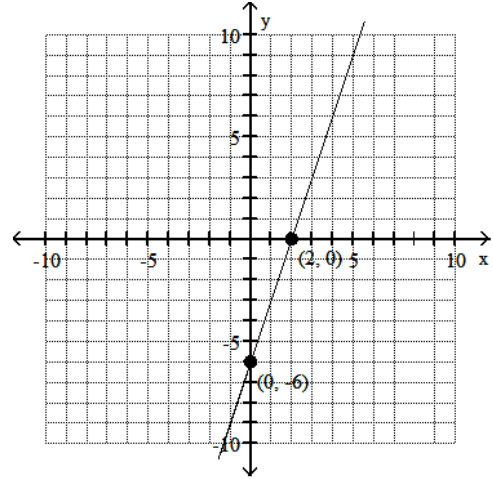
18) $5x - 15y = 30$

18) _____

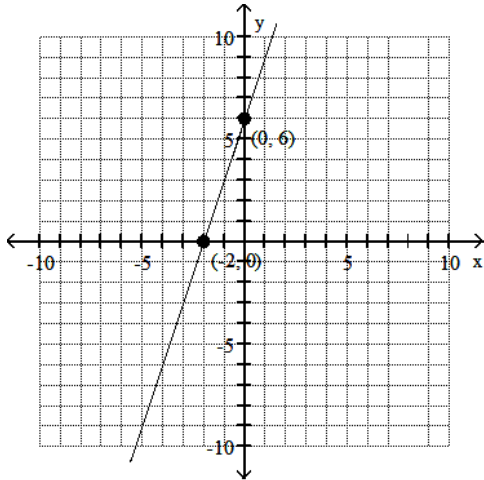
A)



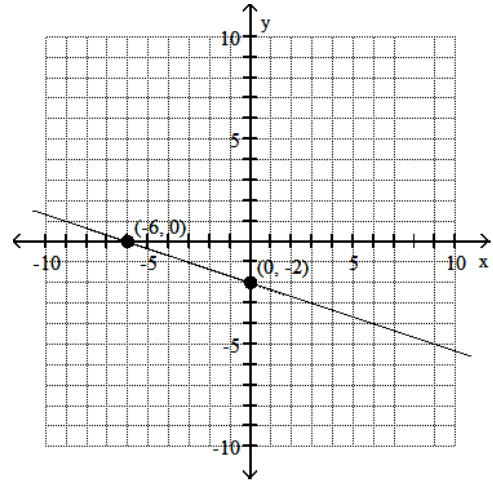
B)



C)



D)

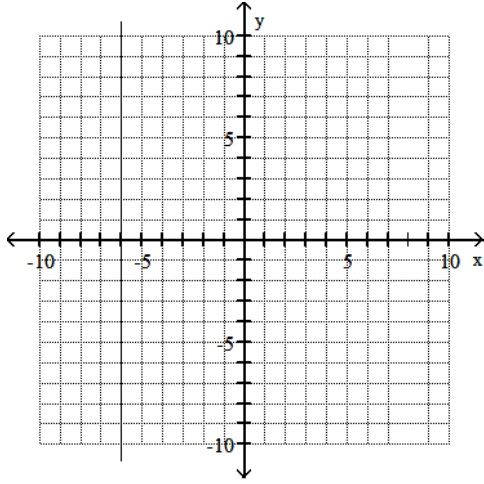


Graph the equation.

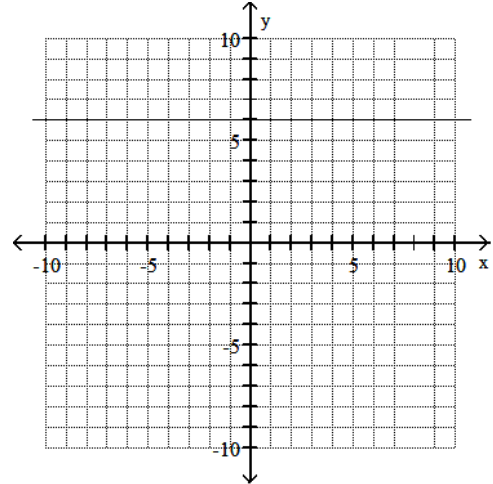
19) $-9y = -54$

19) _____

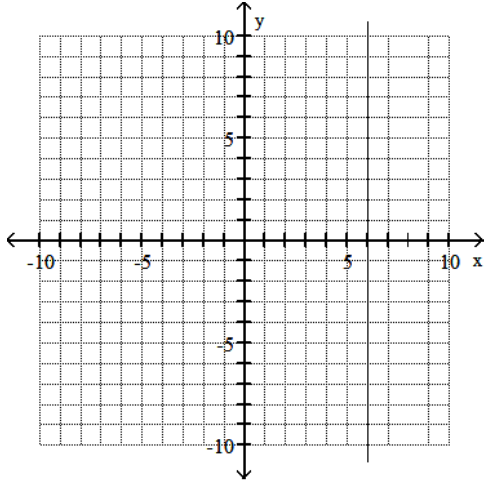
A)



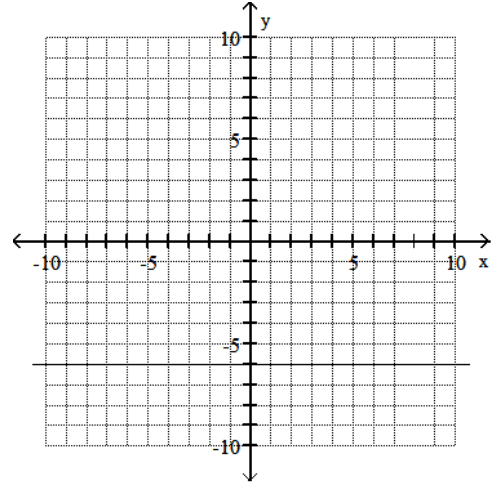
B)



C)



D)

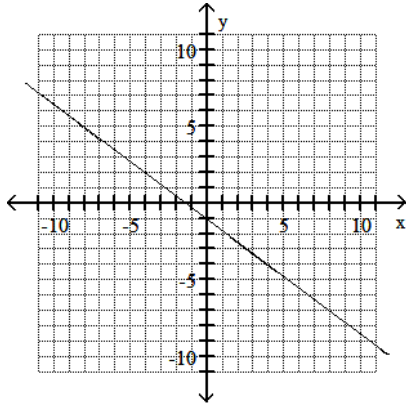


Graph the line.

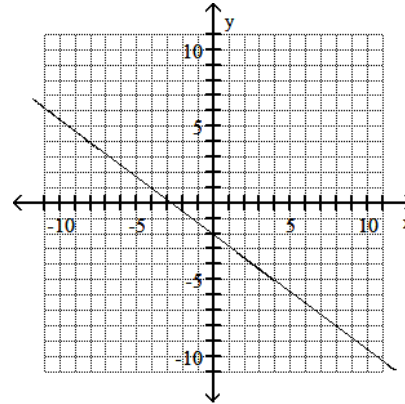
20) $y = -\frac{3}{4}x - 2$

20) _____

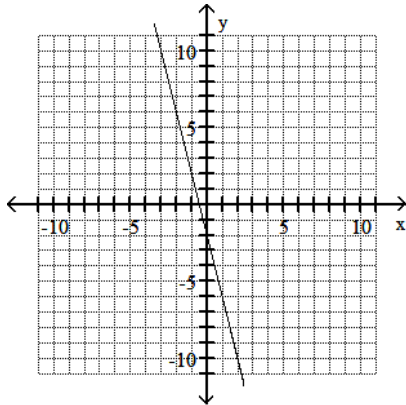
A)



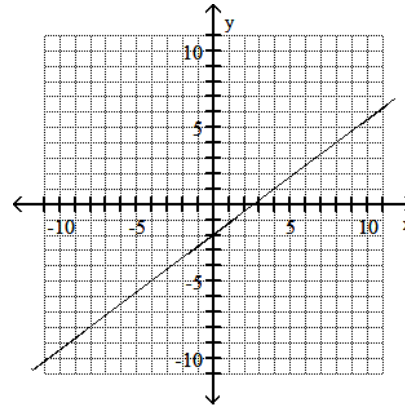
B)



C)



D)



For questions 21-23: Find the slope of a straight line that passes through the given pair of points.

21) (-6, 11) and (7, 7)

21) _____

A) 18

B) $-\frac{13}{4}$

C) $-\frac{4}{13}$

D) $\frac{4}{13}$

22) (8, 3) and (-8, 3)

22) _____

A) 5

B) 2

C) 10

D) 0

23) (-6, -5) and (-3, 7)

23) _____

A) 3

B) 12

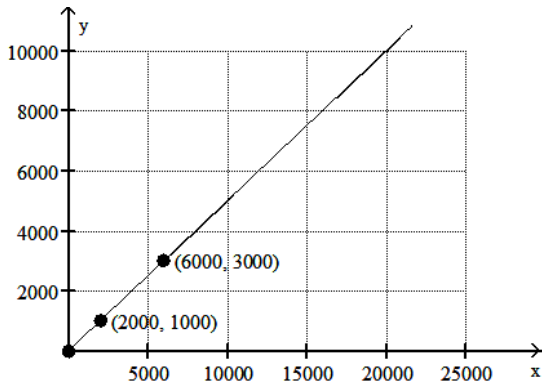
C) 0

D) 4

Determine the rate of change. Don't forget to attach the proper units.

24) The graph shows the total cost y (in dollars) of owning and operating a mini-van where x is the number of miles driven.

24) _____



- A) \$2.00 per mile
C) \$21.00 per mile

- B) cannot be determined
D) \$0.50 per mile

For questions 25-26: Find the slope and the y-intercept.

25) $2x - 3y = 6$

25) _____

A) $m = \frac{2}{3}; (0, -2)$

B) $m = 2; (0, 6)$

C) $m = -\frac{2}{3}; (0, 2)$

D) $m = \frac{3}{2}; (0, 3)$

26) $x + 3y = 1$

26) _____

A) $m = -\frac{1}{3}; (0, \frac{1}{3})$

B) $m = \frac{1}{3}; (0, \frac{1}{3})$

C) $m = -3; (0, 3)$

D) $m = 1; (0, 1)$

For questions 27-28: Write the equation of the line in slope-intercept form.

27) $m = -9$, y-intercept $(0, -2)$

27) _____

A) $y = 9x + 2$

B) $y = -2x - 9$

C) $y = 2x + 9$

D) $y = -9x - 2$

28) $m = \frac{9}{5}$, y-intercept $(0, -5)$

28) _____

A) $y = \frac{9}{5}x + 5$

B) $y = -\frac{9}{5}x - 5$

C) $y = -\frac{9}{5}x + 5$

D) $y = \frac{9}{5}x - 5$

For questions 29-30: Find an equation of the line.

29) vertical line through $(5, -1)$

29) _____

A) $x = 5$

B) $x = -1$

C) $y = -1$

D) $y = 5$

30) Horizontal line through $(-8, 1)$

30) _____

A) $x = 1$

B) $y = -8$

C) $x = -8$

D) $y = 1$

Write an equation of the line passing through the given points.

31) $(5, -6)$ and $(8, -12)$

31) _____

A) $y = -\frac{1}{2}x - \frac{7}{2}$

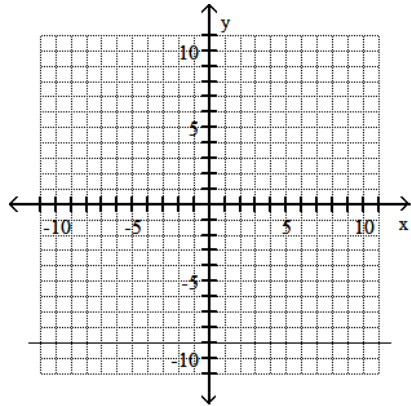
B) $y = -2x + 4$

C) $y = 2x - 16$

D) $y = \frac{1}{2}x - \frac{17}{2}$

Write an equation of the line.

32)



A) $x = -9$

B) $y = x - 9$

C) $y = -9$

D) $y = -9x$

32) _____

Find the domain and range of the relation.

33) $\{(9, 9), (-10, -2), (-13, 3), (11, -3), (-1, 6)\}$

A) Domain = $\{6, -2, 9, 3, -3\}$; range = $\{-1, -10, 9, -13, 11\}$

B) Domain = $\{-1, 6, -10, -2, 9\}$; range = $\{9, -13, 3, 11, -3\}$

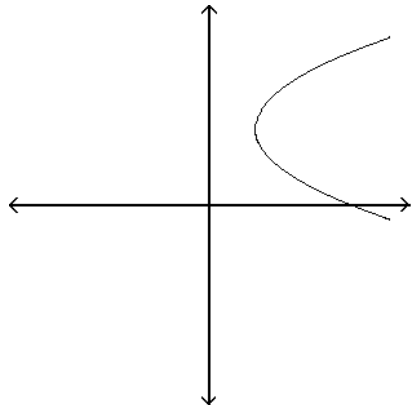
C) Domain = $\{9, -13, 3, 11, -3\}$; range = $\{-1, 6, -10, -2, 9\}$

D) Domain = $\{-1, -10, 9, -13, 11\}$; range = $\{6, -2, 9, 3, -3\}$

33) _____

Determine whether the relation is a function.

34)



A) Not a function

B) Function

34) _____

Given the function, find the indicated value.

35) $f(x) = x^2 + 4x + 6$; $f(-1)$

A) 11

B) -1

C) -9

D) 3

35) _____

36) $f(x) = 3 - 5x$; $f(-10)$

A) -47

B)

C) -50

D) -2

36) _____

For numbers 37-42: Perform the indicated operation and simplify.

37) $(-7x^9)(-4x^7)$

A) $-28x^{63}$

B) $28x^{63}$

C) $28x^{16}$

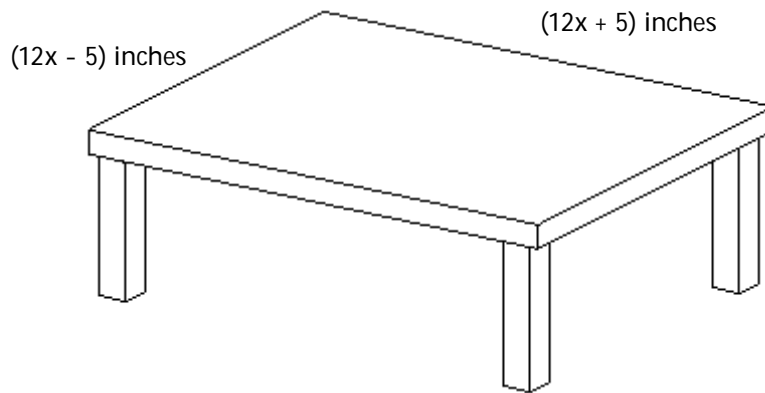
D) $-28x^{16}$

37) _____

- 38) $-9x(2x + 8)$ 38) _____
 A) $-18x^2 - 72x$ B) $-90x^2$ C) $2x^2 - 72x$ D) $-18x^2 + 8x$
- 39) $5x^5(8x^3 - 2x^2 - 9)$ 39) _____
 A) $40x^8 - 10x^7 - 45x^5$ B) $40x^3 - 10x^2 - 45$
 C) $40x^8 - 2x^2 - 9$ D) $40x^8 - 10x^7$
- 40) $-9x^2(10x^5 + 3x^3)$ 40) _____
 A) $-117x^7 - 117x^5$ B) $-90x^7 - 27x^5$ C) $-117x^2$ D) $-90x^7 + 3x^3$
- 41) $(5x + 6)^2$ 41) _____
 A) $25x^2 + 60x + 36$ B) $5x^2 + 60x + 36$ C) $5x^2 + 36$ D) $25x^2 + 36$
- 42) $(x - 6)(5x + 9)$ 42) _____
 A) $5x^2 - 21x - 54$ B) $5x^2 - 21x - 21$ C) $5x^2 - 23x - 54$ D) $5x^2 - 54x - 21$

Solve.

- 43) Find the area of the top of the table. Express the area as a product, then multiply and simplify. 43) _____



- A) $(144x^2 - 25)$ sq in. B) $(144x^2 - 120x - 25)$ sq in.
 C) $(x^2 - 25)$ sq in. D) $(144x^2 + 120x - 25)$ sq in.

Simplify.

- 44) $\left(\frac{xy^3}{z^5}\right)^5$ 44) _____
 A) $\frac{xy^8}{z^{10}}$ B) $\frac{x^5y^{15}}{z^{25}}$ C) $\frac{xy^{15}}{z^{25}}$ D) $\frac{x^5y^8}{z^{10}}$
- 45) $\left(\frac{3x^2y^3}{z^3}\right)^4$ 45) _____
 A) $\frac{81x^8y^{12}}{z^{12}}$ B) $\frac{3x^8y^{12}}{z^7}$ C) $\frac{81x^6y^7}{z^7}$ D) $\frac{3x^8y^{12}}{z^{12}}$

46) $(6a^6b^5c^0)^2$ 46) _____
 A) $36a^{12}b^{10}c^2$ B) $6a^{12}b^{10}$ C) $36a^{12}b^{10}$ D) 0

Divide. Leave your answer in exponent form. Assume that all variables in any denominator are nonzero.

47) $\frac{21m^{12}n^{11}}{3m^{11}n^7}$ 47) _____
 A) $7n^4$ B) $21mn^4$ C) $7mn^4$ D) $7m^{23}n^{18}$

Simplify. Express your answer with positive exponents. Assume that all variables are nonzero.

48) $\left(\frac{xy^3}{x^3y}\right)^{-2}$ 48) _____
 A) $\frac{1}{x^5y^7}$ B) $\frac{1}{x^8y^8}$ C) $\frac{y^4}{x^4}$ D) $\frac{x^4}{y^4}$

49) $(x^{-4}y^5)^{-3}$ 49) _____
 A) $\frac{x^{12}}{y^{15}}$ B) $\frac{y^2}{x^{-7}}$ C) $\frac{x^{-7}}{y^2}$ D) $\frac{1}{x^{12}y^{15}}$

50) $\frac{5x^{-3}y^{-3}}{2z^{-2}}$ 50) _____
 A) $\frac{4z^2}{125x^3y^3}$ B) $\frac{2z^2}{5x^3y^3}$ C) $\frac{5z^2}{2x^3y^3}$ D) $\frac{5}{2x^3y^3z^2}$

Divide.

51) $\frac{36x^9 - 8x^6 + 40x^3}{4x^3}$ 51) _____
 A) $9x^6 - 2x^3 + 10$ B) $36x^6 - 8x^3 + 40$
 C) $9x^9 - 2x^6 + 10x^3$ D) $9x^6 + 2x^3 - 10$

Perform the division.

52) $\frac{-21x^6 + 21x^5 - 12x^4}{-3x^5}$ 52) _____
 A) $7x + 21x^5 + \frac{4}{x}$ B) $7x - 7 + \frac{4}{x}$ C) $7x - 7$ D) $11x - 7$

For numbers 53 and 54: Factor the polynomial by factoring out a negative greatest common factor.

53) $-21y^3 + 15y$ 53) _____
 A) $-3(7y^3 + 5y)$ B) $-3y(7y^2 + 5)$ C) $-3y(7y^2 - 5)$ D) $-3y^2(7y - 5)$

54) $-10x^4 + 15x^3 - 5x^2$ 54) _____
 A) $-5x^2(2x^2 - 3x - 1)$ B) $-5x^2(2x^2 + 3x - 1)$
 C) $-5x^2(2x^2 + 3x + 1)$ D) $-5x^2(2x^2 - 3x + 1)$

For numbers 55-60 : Factor the polynomial COMPLETELY. Write prime if the polynomial cannot be factored.

55) $27x^2 - 117x - 90$ 55) _____
 A) $9(3x - 2)(x + 5)$ B) $(27x + 18)(x - 5)$ C) prime D) $9(3x + 2)(x - 5)$

56) $xy^2 + 3y^2 - 25x - 75$ 56) _____
 A) $(x + 3)(y - 5)^2$ B) $(x - 3)(y + 5)(y - 5)$
 C) $(x + 3)(y + 5)(y - 5)$ D) $(x + 3)(y^2 - 25)$

57) $10x^2 + 6x - 15x - 9$ 57) _____
 A) $(10x - 3)(x + 3)$ B) $(2x + 3)(5x - 3)$ C) $(10x + 3)(x - 3)$ D) $(2x - 3)(5x + 3)$

58) $15x^2 + 20x - 12x - 16$ 58) _____
 A) $(15x - 4)(x + 4)$ B) $(5x - 4)(3x + 4)$ C) $(5x + 4)(3x - 4)$ D) $(15x + 4)(x - 4)$

59) $6y^2 - 13y + 6$ 59) _____
 A) $(2y - 3)(3y - 2)$ B) $(6y + 3)(y + 2)$ C) $(2y + 3)(3y + 2)$ D) prime

60) $9x^2 - 39x - 30$ 60) _____
 A) $3(3x + 2)(x - 5)$ B) $3(3x - 2)(x + 5)$ C) prime D) $(9x + 6)(x - 5)$

For questions 61-66: Solve the equation.

61) $x^2 - 4x = 0$ 61) _____
 A) $x = 0, x = -4$ B) $x = 0, x = 4$ C) $x = -4$ D) $x = 4$

62) $x^2 - x = 56$ 62) _____
 A) $x = -7, 8$ B) $x = 1, 56$ C) $x = 7, 8$ D) $x = -7, -8$

63) $11d^2 - 4d = 0$ 63) _____
 A) $d = -\frac{11}{4}, 0$ B) $d = \frac{11}{4}, 0$ C) $d = \frac{4}{11}, 0$ D) $d = -\frac{4}{11}, 0$

Solve the problem.

64) A window washer accidentally drops a bucket from the top of a 144-foot building. The height h of the bucket after t seconds is given by $h = -16t^2 + 144$. When will the bucket hit the ground? 64) _____
 A) -3 sec B) 9 sec C) 48 sec D) 3 sec

For numbers 65-66: Find any numbers for which the rational expression is undefined.

65) $\frac{z - 2}{7 - z}$ 65) _____
 A) $z = -7$ B) $z = 7$ C) $z = 7, z = 2$ D) none

66) $\frac{7y - 8}{y^2 - 9}$ 66) _____
 A) $y = 3$ B) $y = 3, y = -3$ C) $y = \frac{8}{7}$ D) $y = 9$

Find the domain of the rational expression.

$$67) f(x) = \frac{8x}{5+x}$$

67) _____

- A) All real numbers except -5
C) All real numbers greater than 5

- B) All real number except 5
D) All real numbers except 0

For numbers 68-69: Solve the problem.

68) The demand for a rooftop-mounted industrial air conditioner is given by the demand function

68) _____

$$D(x) = \frac{9800}{x^2 + 5x}$$

where x is the number of units produced each day and $D(x)$ is the number sold each day. Assume that x is an integer. What is the domain of the demand function from a purely mathematical point of view?

- A) All integers greater than 0
C) All integers

- B) All integers other than -5 or 0
D) All integers other than 5 or 0

Solve the problem.

69) A drug is injected into a patient and the concentration of the drug is monitored. The drug's concentration, $C(t)$, in milligrams after t hours is modeled by $C(t) = \frac{4t}{3t^2 + 4}$. Estimate the drug's concentration after 3 hours. (Round to the nearest hundredth.)

69) _____

- A) 0.78 mg B) 0.39 mg C) 0.92 mg D) 0.25 mg

For problems 70-72: Perform the operation indicated and simplify.

$$70) \frac{(x-10)^2}{5} \div \frac{5x-50}{25}$$

70) _____

A) $\frac{1}{x-10}$

B) $x-10$

C) $\frac{5(x-10)^2}{5x-50}$

D) $\frac{(x-10)^3}{25}$

$$71) \frac{x^2-16}{4y} \div \frac{4-x}{28xy}$$

71) _____

A) $7x(x+4)$

B) $-7x(x-4)$

C) $-7x(x+4)$

D) $7x(x-4)$

$$72) \frac{x+8}{5-x} \div \frac{x^2-7x-8}{x^2-13x+40}$$

72) _____

A) $\frac{x-8}{x+1}$

B) $-\frac{(x+8)(x-8)}{(x-5)^2}$

C) $-\frac{x-8}{x+1}$

D) $-\frac{x+8}{x+1}$

For problems 73-74: Simplify. Assume that all variables represent positive numbers.

$$73) \sqrt{75y^2}$$

73) _____

A) $5y\sqrt{3}$

B) $5y^2\sqrt{3}$

C) $5\sqrt{3y^2}$

D) $5\sqrt{3}$

$$74) \sqrt{175x^2y}$$

74) _____

A) $5xy^2\sqrt{7}$

B) $5xy\sqrt{7}$

C) $5x^2\sqrt{7y}$

D) $5x\sqrt{7y}$

For problems 75-76: Solve the radical equation. Check all proposed solutions.

75) $\sqrt{6x - 5} = 5$

A) $x = 25$

B) $x = \frac{10}{3}$

C) $x = \frac{25}{6}$

D) $x = 5$

75) _____

76) $\sqrt{4x + 5} = 5$

A) $x = \frac{15}{2}$

B) $x = 25$

C) $x = 5$

D) $x = \frac{25}{4}$

76) _____

Solve.

77) A ball is thrown downward with an initial velocity of 14 meters per second from a cliff that is 80 meters high. The height of the ball is given by the quadratic equation $h = -4.9t^2 - 14t + 80$ where h is in meters and t is the time in seconds since the ball was thrown. Find the time it takes the ball to hit the ground. Round your answer to the nearest tenth of a second.

A) 2.8 sec

B) 3.9 sec

C) 3.0 sec

D) 2.9 sec

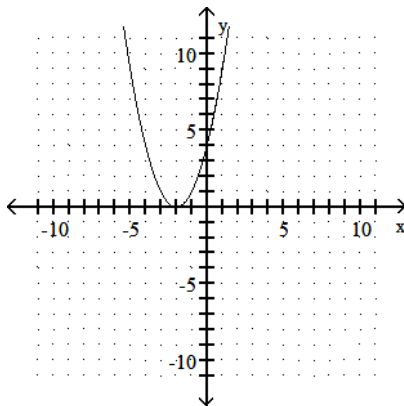
77) _____

Sketch the graph of the quadratic function.

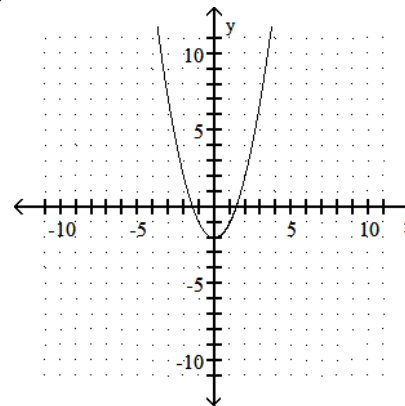
78) $f(x) = x^2 - 2$

78) _____

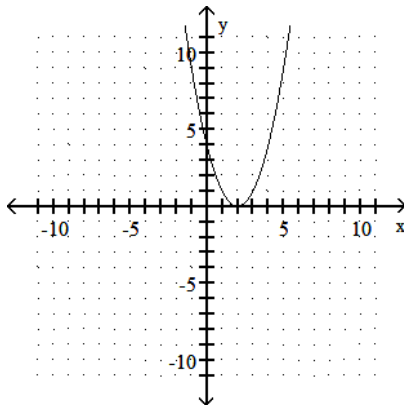
A)



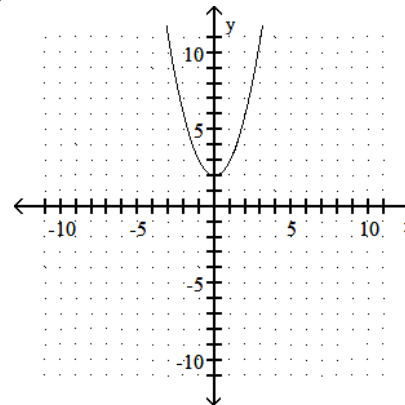
B)



C)



D)



Answer Key

Testname: MATH0015 REVIEW AY20_21

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

Answer Key

Testname: MATH0015 REVIEW AY20_21

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