

MIAMI DADE COLLEGE
INTERAMERICAN CAMPUS
MATHEMATICS

CPT ALGEBRA

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

Write the number as the product of prime factors.

1) 90

A) $2 \cdot 2 \cdot 3 \cdot 3 \cdot 5$

B) $2 \cdot 3 \cdot 5$

C) $10 \cdot 3 \cdot 3$

D) $2 \cdot 3 \cdot 3 \cdot 5$

Write the fraction in lowest terms.

2) $\frac{21}{45}$

A) $\frac{11}{5}$

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

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

D) $\frac{21}{45}$

3) $\frac{200}{250}$

A) $\frac{249}{199}$

B) $\frac{4}{5}$

C) $\frac{201}{251}$

D) $\frac{5}{4}$

Find the product and write it in lowest terms.

4) $\frac{3}{4} \cdot \frac{17}{21}$

A) $\frac{1}{28}$

B) $\frac{23}{29}$

C) $\frac{17}{28}$

D) $\frac{68}{63}$

Find the quotient and write it in lowest terms.

5) $\frac{3}{7} \div 1\frac{2}{3}$

A) $\frac{5}{7}$

B) $\frac{3}{140}$

C) $\frac{9}{35}$

D) 1

Find the sum and write it in lowest terms.

6) $\frac{13}{10} + \frac{5}{8} + \frac{1}{5}$

A) $2\frac{1}{8}$

B) $\frac{53}{70}$

C) $\frac{53}{8000}$

D) $242\frac{6}{7}$

Find the difference and write it in lowest terms.

7) $9\frac{1}{3} - 3\frac{1}{4}$

A) $\frac{12}{73}$

B) $1\frac{1}{4}$

C) $6\frac{1}{12}$

D) $24\frac{1}{3}$

Find the value of the expression.

8) $\frac{3(7 - 4) + 3 \cdot 4}{3(5 - 3)}$

A) $\frac{5}{2}$

B) $\frac{1}{2}$

C) $\frac{5}{4}$

D) $\frac{7}{2}$

Evaluate the expression for the given values. If necessary, round to the nearest tenth.

9) $(x + 2y)^2$ $x = 3, y = 4$

A) 121

B) 25

C) 22

D) 11

State the phrase as a mathematical expression. Use x to represent the variable.

10) The difference between two times a number and four

A) $2 - x + 4$

B) $2x - 4$

C) $4 - 2x$

D) $4 + 2x$

11) The product of eight and six more than a number

A) $8(x + 6)$

B) $(8 + 6)x$

C) $8 \cdot 6 + x$

D) $8 + 6 \cdot x$

Select the smaller of the two given numbers.

12) $|-4|, |-22|$

A) $|-22|$

B) $|-4|$

Find the sum.

13) $1 + [(-7) + (-12)]$

A) -18

B) 6

C) 20

D) -4

14) $[2 + (-3)] + [22 + (-7)]$

A) 34

B) -30

C) -16

D) 14

Find the difference.

15) $\left(-\frac{5}{9} + \frac{1}{7}\right) - \left(\frac{3}{5} - \frac{2}{3}\right)$

A) $-\frac{1}{15}$

B) $-\frac{26}{2835}$

C) $-\frac{109}{315}$

D) $-\frac{26}{63}$

16) $(1 - 9) - [(-17) - (-13)]$

A) -38

B) -4

C) 12

D) 14

Perform the indicated operations.

17) $5(-8) + |6 - 13|$

A) -47

B) -33

C) 47

D) 33

18) $\frac{(-2)[6 - (-7)] + (-2)(6)}{(-2)(7 - 4)}$

A) 0

B) $\frac{19}{3}$

C) 2

D) $\frac{21}{5}$

Simplify the expression by combining like terms.

19) $3p^2 + 7p^3 - 9p^2 - 3p^3$

A) $10p^2 - 12p^3$

B) $-2p^2p^3$

C) $-2p^2$

D) $-6p^2 + 4p^3$

Convert the phrase into a mathematical expression. Use x as the variable. Combine like terms when possible.

20) 8 times the sum of 10 times a number and 7

A) $8(10x + 7); 80x + 56$

B) $8(x + 7); 8x + 56$

C) $8 + 10x + 7; 10x + 15$

D) $8(10(x + 7)); 80x + 560$

Solve the equation.

21) $\frac{1}{3}(r + 6) = \frac{1}{6}(r + 8)$

A) $\{-4\}$

B) $\{4\}$

C) $\{-12\}$

D) $\{3\}$

22) $\frac{5}{y} = \frac{15}{12}$

A) 4

B) 40

C) $\frac{4}{25}$

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

23) $\frac{2}{5}x - \frac{1}{3}x = 3$

A) $\{-90\}$

B) $\{90\}$

C) $\{-45\}$

D) $\{45\}$

24) $0.4(40) + 0.6x = 0.5(40 + x)$

A) $\{40\}$

B) $\{20\}$

C) $\{30\}$

D) $\{50\}$

25) $6x - (3x - 1) = 2$

A) $\left\{\frac{1}{9}\right\}$

B) $\left\{-\frac{1}{9}\right\}$

C) $\left\{-\frac{1}{3}\right\}$

D) $\left\{\frac{1}{3}\right\}$

26) $-\frac{1}{6}x = -3$

A) $\{-10\}$

B) $\{0\}$

C) $\{-9\}$

D) $\{18\}$

27) $z - 4 = -1$

A) $\{5\}$

B) $\{3\}$

C) $\{-5\}$

D) $\{-3\}$

28) $8x + 3x - 4x = 28$

A) $\{4\}$

B) $\{21\}$

C) $\left\{\frac{1}{4}\right\}$

D) $\left\{\frac{1}{7}\right\}$

29) $-x = 26$

A) $\{-26\}$

B) $\{0\}$

C) $\{26\}$

D) $\{1\}$

$$30) \frac{4r - 4}{r} = \frac{9}{5}$$

A) $\frac{5}{11}$

B) $\frac{4}{5}$

C) $\frac{11}{20}$

D) $\frac{20}{11}$

$$31) -5y + 4 = -4 + 8y$$

A) $\left\{ \frac{3}{0} \right\}$

B) $\left\{ \frac{8}{13} \right\}$

C) $\left\{ -\frac{13}{8} \right\}$

D) $\left\{ \frac{13}{8} \right\}$

A formula is given along with the values of all but one of the variables in the formula. Find the value of the variable not given.

$$32) P = 2L + 2W; L = 6, W = 5$$

A) 17

B) 22

C) 11

D) 60

Solve the problem.

33) From a point on a straight road, John and Fred ride bicycles in opposite directions. John rides 10 miles per hour and Fred rides 6 miles per hour. In how many hours will they be 80 miles apart?

A) Not enough information

B) 5 hours

C) 6 hours

D) 4 hours

34) If 4 hours are required to type 24 pages, how many hours would be required to type 42 pages?

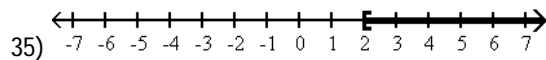
A) 2 hours

B) 3 hours

C) 7 hours

D) 8 hours

Write an inequality involving the variable x that describes the set of numbers graphed.



A) $x > 2$

B) $x \geq 2$

C) $x < 2$

D) $x \leq 2$

Solve the formula for the specified variable.

$$36) P = a + b + c \text{ for } a$$

A) $a = b + P - c$

B) $a = P + b + c$

C) $a = P - b - c$

D) $a = b + c - P$

$$37) A = \frac{1}{2}bh \text{ for } b$$

A) $b = \frac{A}{2h}$

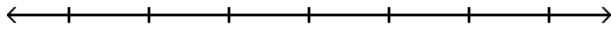
B) $b = \frac{h}{2A}$

C) $b = \frac{2A}{h}$

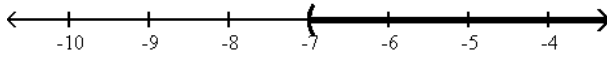
D) $b = \frac{Ah}{2}$

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

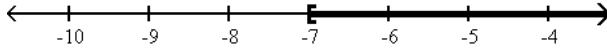
38) $18x - 3 > 3(5x - 8)$



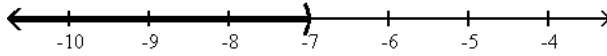
A) $(-7, \infty)$



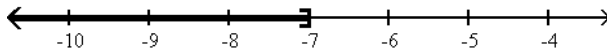
B) $[-7, \infty)$



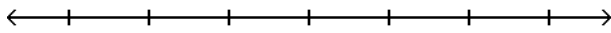
C) $(-\infty, -7)$



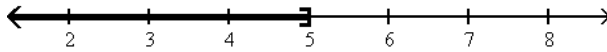
D) $(-\infty, -7]$



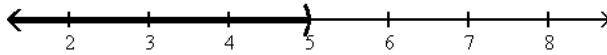
39) $12n - 27 \leq 3(3n - 4)$



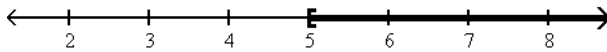
A) $(-\infty, 5]$



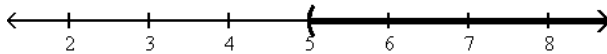
B) $(-\infty, 5)$



C) $[5, \infty)$



D) $(5, \infty)$



Solve the equation. First simplify the expression by combining like terms.

40) $-3a + 3 + 4a = 8 - 27$

A) $\{ 38 \}$

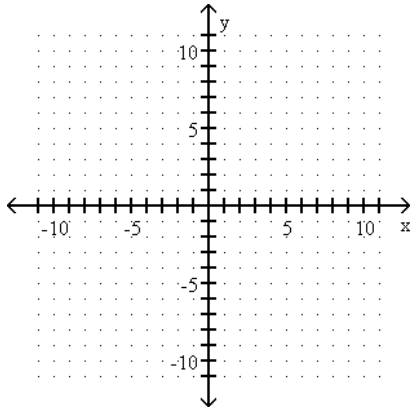
B) $\{ -22 \}$

C) $\{ -38 \}$

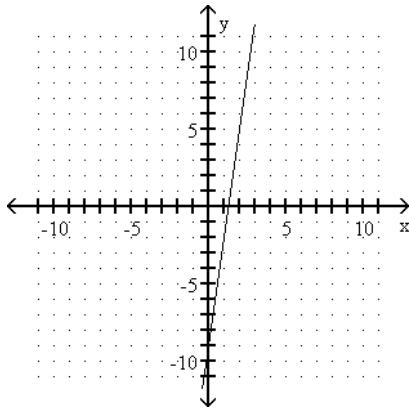
D) $\{ 22 \}$

Graph the linear equation.

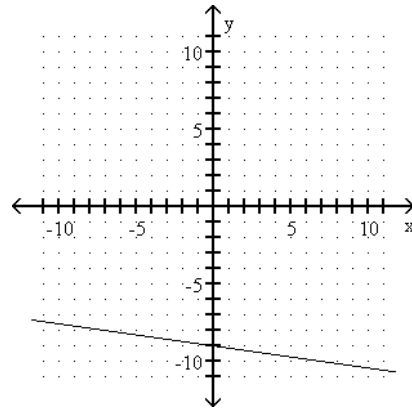
41) $7x = y - 9$



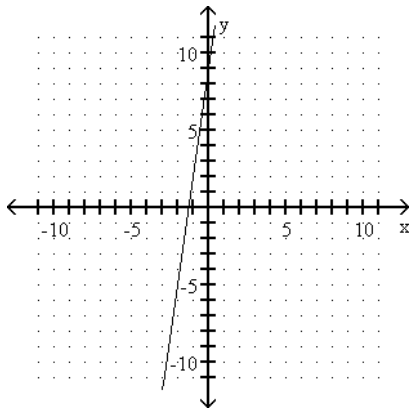
A)



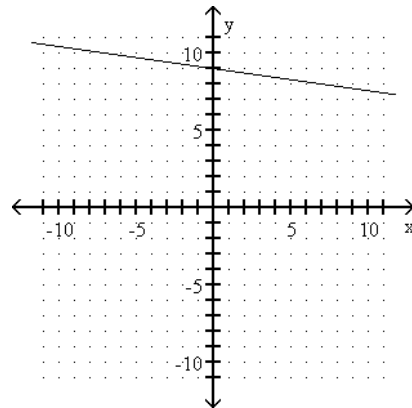
B)



C)



D)



Find the intercepts for the graph of the equation.

42) $-2x + y = 8$

A) $(-4, 0)$ $(0, 8)$

B) $(0, -7)$ $(0, -6)$

C) $(8, -6)$ $(-7, 8)$

D) $(-7, 0)$ $(-6, 0)$

Decide whether or not the ordered pair is a solution to the equation.

43) $5x - 5y = 25$; $(3, 2)$

A) No

B) Yes

Complete the ordered pair for the given equation.

44) $y = -4x - 28$ $(-8, \quad)$

A) $(-8, 4)$

B) $(-8, 8)$

C) $(-8, -8)$

D) $(-8, -28)$

Find the intercepts for the graph of the equation.

45) $x + y = 6$

A) (3, 0) (3, 0)

B) (6, 3) (3, 6)

C) (6, 0) (0, 6)

D) (0, 3) (0, 3)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

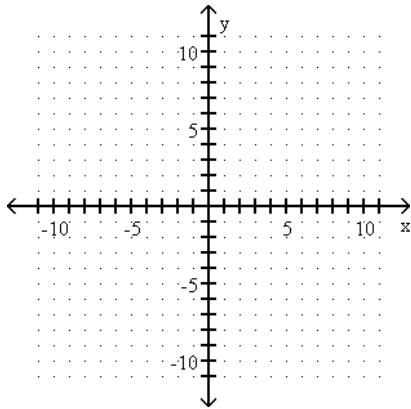
Decide whether or not the ordered pair is a solution to the equation.

46) $-8x - 9y = -77$; (4, 5)

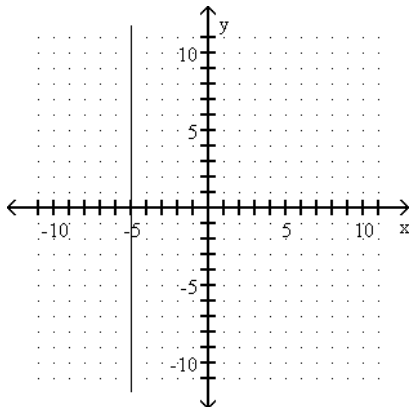
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the linear equation.

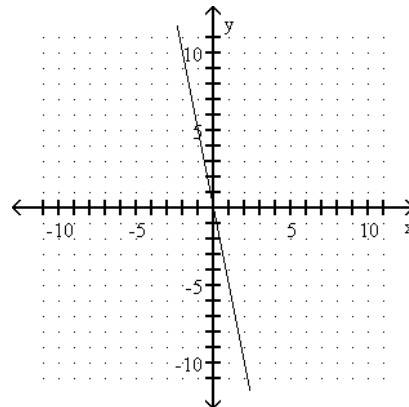
47) $x = -5$



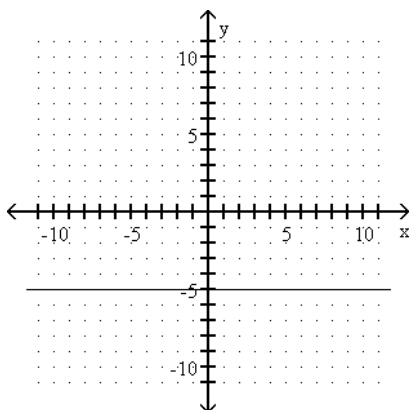
A)



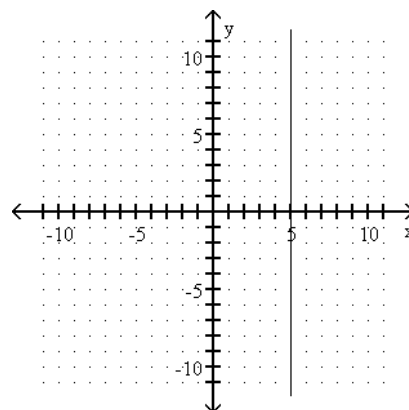
B)



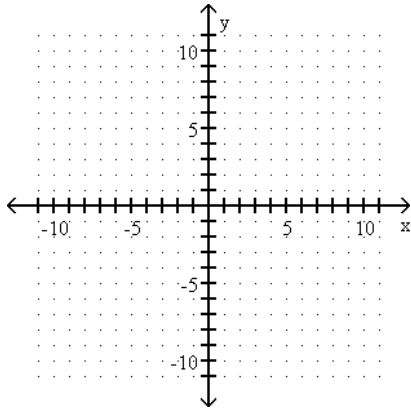
C)



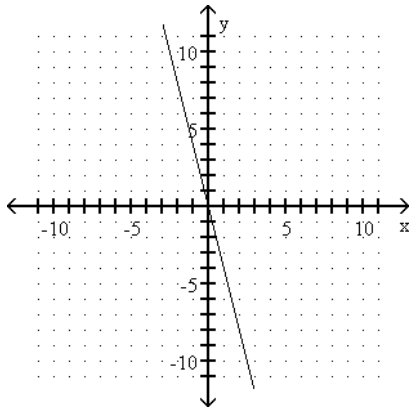
D)



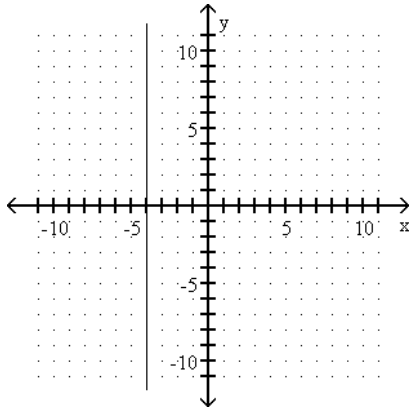
48) $y + 4 = 0$



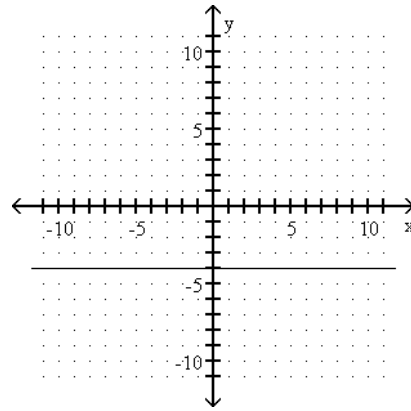
A)



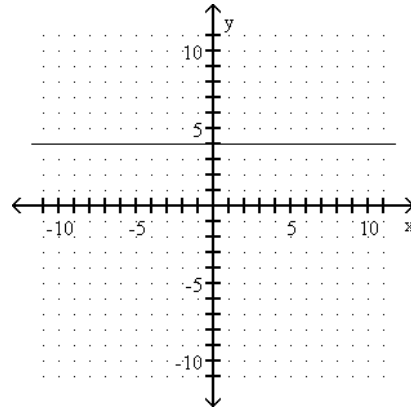
C)



B)

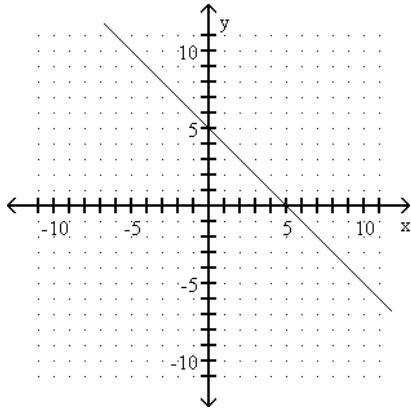


D)

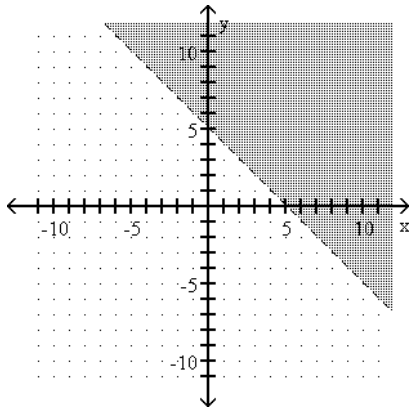


Complete the graph by shading the correct region.

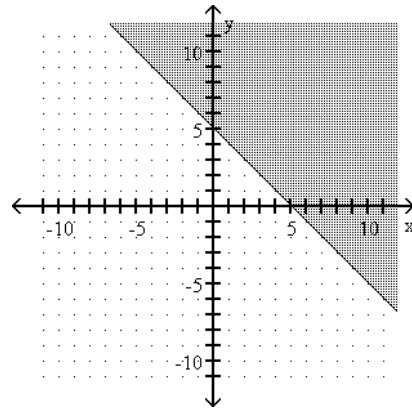
49) $x + y \leq 5$



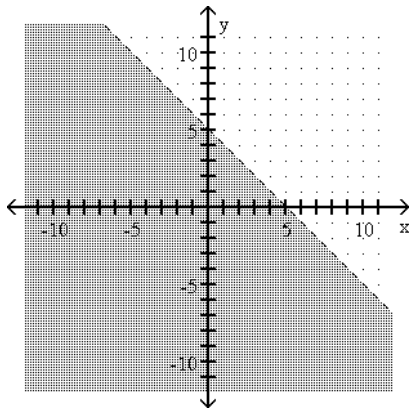
A)



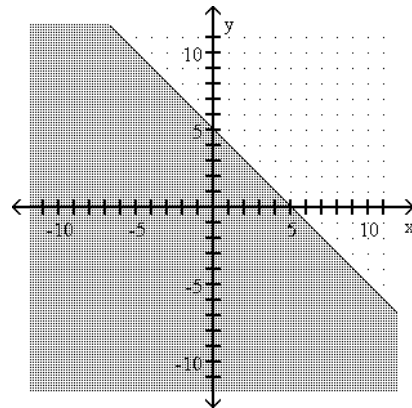
B)



C)



D)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

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

50) $(-2, 2)$

$3x = -4 - y$

$4x = -2 - 3y$

Decide if the graph of the system is a pair of parallel lines, intersecting lines, or one line.

51) $x + y = 0$

$x - y = 6$

Complete the ordered pair for the equation.

52) $y = -5x - 19$ $(-5,)$

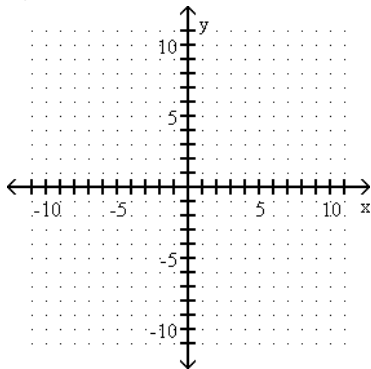
Find the intercepts for the equation.

53) $-4x + 4y = 8$

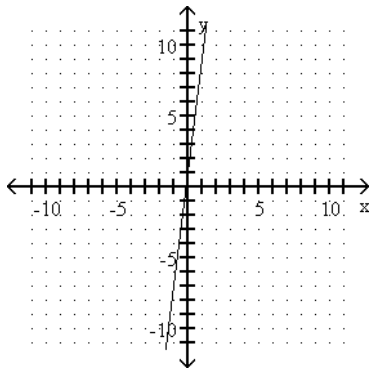
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the linear equation.

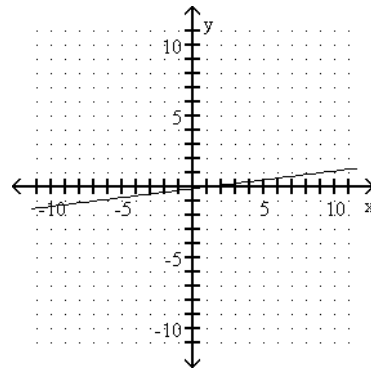
54) $8y = x + 1$



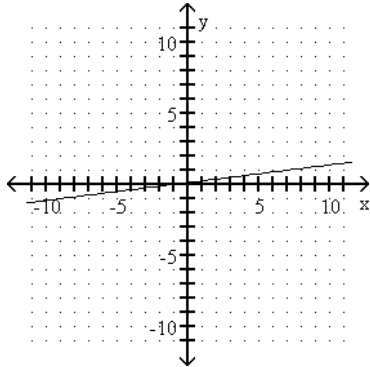
A)



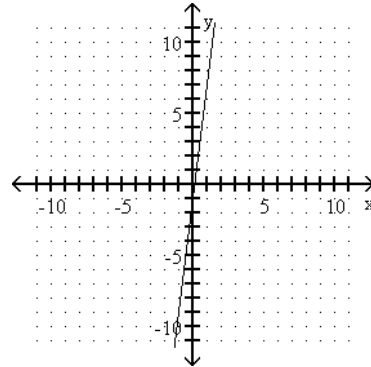
B)



C)



D)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the slope of the line going through the pair of points.

55) $(-9, -8), (-2, -5)$

Find the slope of the line.

56) $-4y = -2x - 16$

Write an equation of the line with the given slope and y-intercept.

57) $m = \frac{8}{5}$; (0, -5)

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

Write the slope-intercept form of the equation.

58) Through (2, 3); $m = -2$

A) $y = -2x + 7$

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

C) $y = -2x - 7$

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

59) (5, 8) and (0, -6)

A) $y = \frac{1}{2}x - 6$

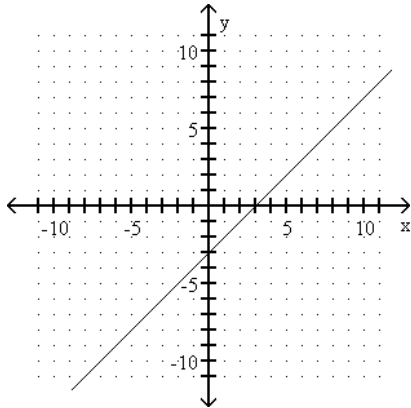
B) $y = -\frac{14}{5}x - 6$

C) $y = \frac{14}{5}x - 6$

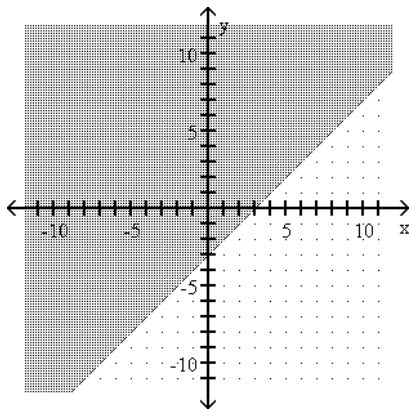
D) $y = -\frac{1}{2}x - 6$

Complete the graph by shading the correct region.

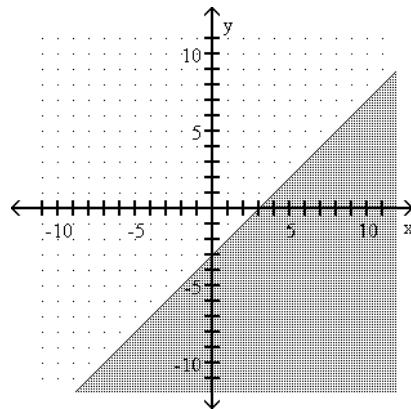
60) $y \geq x - 3$



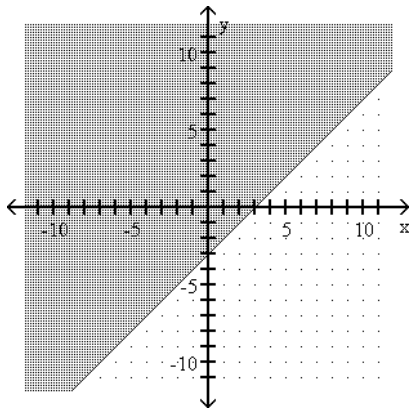
A)



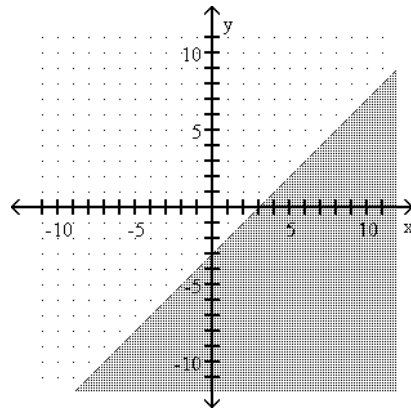
B)



C)



D)



Find three solutions for the equation.

61) $y = -2x + 7$

A) (0, 7), (4, -22), (6, -26)

C) (4, -15), (5, -17), (6, -19)

B) (4, -1), (5, -1), (6, -1)

D) (0, 7), (5, -3), (6, -5)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

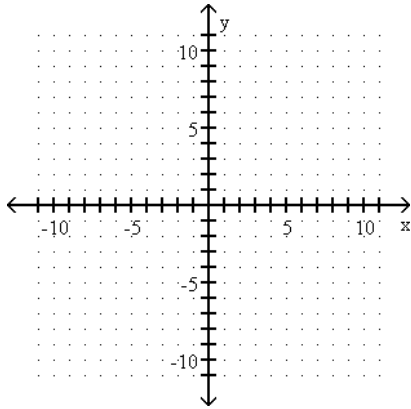
Find the slope of the line through the pair of points.

62) (8, -2) and (-6, -3)

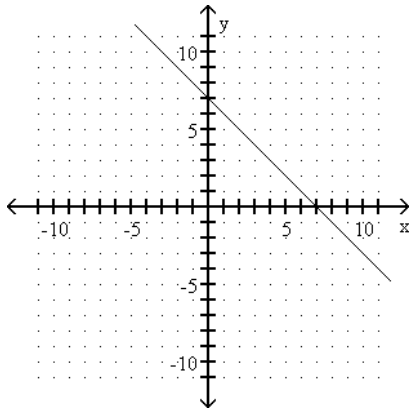
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Draw the graph of the line that contains the specified point and has the specified slope, m .

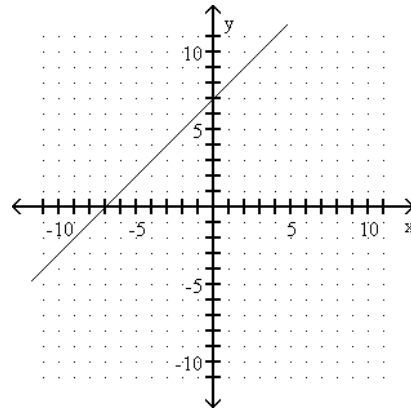
63) $(-9, -2)$, $m = 1$



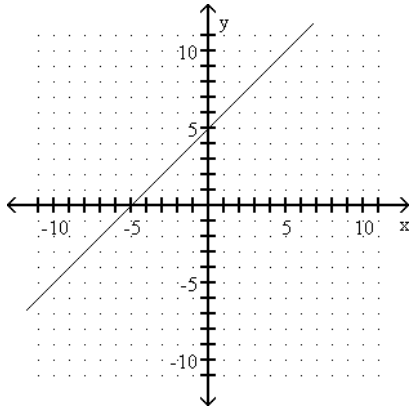
A)



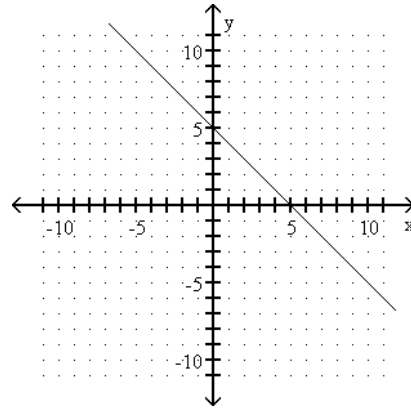
B)



C)



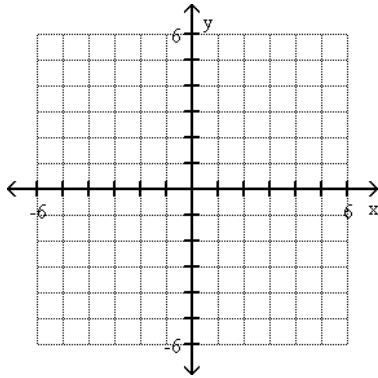
D)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Plot the ordered pairs on the rectangular coordinate system provided.

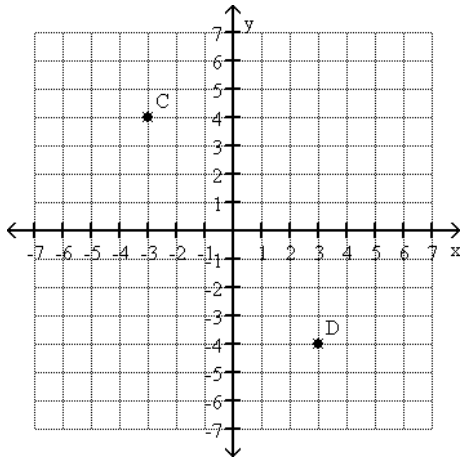
64) A(4, 1), B(-5, 1)



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

Find the coordinates of the labeled points.

65)



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

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

C) C(4, 10); D(-4, 3)

D) C(-3, 4); D(3, -4)

Solve by the substitution method.

66) $x + 5y = -5$

$8x + 4y = 32$

A) \emptyset

B) $\{(4, -1)\}$

C) $\{(-5, -1)\}$

D) $\{(5, -2)\}$

67) $x + y = 4$

$5x + 5y = 20$

A) $\{(4, 5)\}$

C) $\{(0, 0)\}$

B) Infinite number of solutions

D) $\{(2, 2)\}$

68) $x + y = 2$

$x + y = 4$

A) $\{(0, 0)\}$

B) $\{(0, 6)\}$

C) \emptyset

D) $\{(2, 4)\}$

Clear fractions then solve by substitution.

$$69) \frac{1}{2}x + \frac{1}{2}y = 3$$

$$x - y = -8$$

A) $\{(1, 8)\}$

B) \emptyset

C) $\{(-1, 7)\}$

D) $\{(-2, 8)\}$

Solve the system by the elimination method.

$$70) 4x - y = 23$$

$$3x + y = 19$$

A) \emptyset

B) $\{(1, 6)\}$

C) $\{(6, 2)\}$

D) $\{(6, 1)\}$

$$71) 7x - 5y = 35$$

$$3x + 2y = 15$$

A) $\{(5, 1)\}$

B) $\{(4, 1)\}$

C) \emptyset

D) $\{(5, 0)\}$

$$72) 7x + 2y = 7 + 2x - 3y$$

$$2x + 5y = 4 - 4x$$

A) $\{(-3, \frac{22}{5})\}$

B) $\{(-\frac{1}{3}, \frac{5}{22})\}$

C) $\{(\frac{5}{22}, -\frac{1}{3})\}$

D) $\{(\frac{22}{5}, -3)\}$

Solve the system by any method.

$$73) 4x - \frac{5}{2}y = 10$$

$$4x - \frac{5}{3}y = \frac{40}{3}$$

A) $\{(5, 4)\}$

B) \emptyset

C) $\{(6, 3)\}$

D) $\{(-5, 3)\}$

Solve the problem.

74) A woman made a deposit of \$329. If her deposit consisted of 97 bills, some of them one-dollar bills and the rest being five-dollar bills, how many one-dollar bills did she deposit?

A) 29 one-dollars

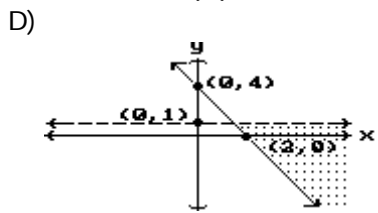
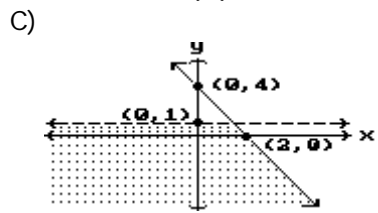
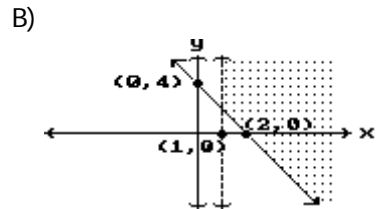
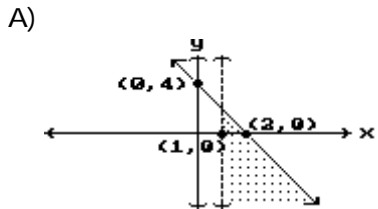
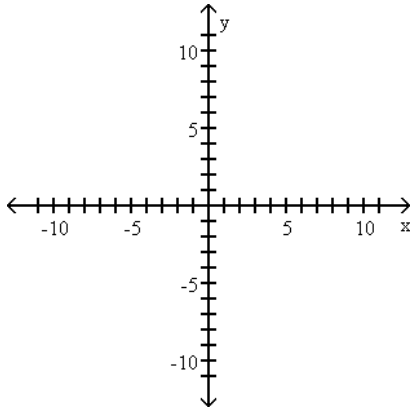
B) 34 one-dollars

C) 39 one-dollars

D) 58 one-dollars

Graph the system of inequalities. Indicate the solution by shading.

75) $2x + y \leq 4$
 $x - 1 > 0$



Solve the system by any method.

76) $\frac{3x}{8} - \frac{3y}{5} = \frac{33}{80}$
 $\frac{4x}{7} + \frac{4y}{5} = \frac{37}{35}$

A) $\{(\frac{3}{4}, \frac{1}{2})\}$

B) $\{(\frac{3}{2}, \frac{3}{4})\}$

C) $\{(\frac{1}{4}, \frac{1}{2})\}$

D) $\{(\frac{3}{2}, \frac{1}{4})\}$

Solve the problem.

77) In a chemistry class, 3 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

A) 2.5 L

B) 0.5 L

C) 1.5 L

D) 3.0 L

Provide an appropriate response.

78) Decide whether the elimination method or the substitution method involves the least amount of work. Do not solve.

$7x - 6y = -80$

$-9x + 7y = 100$

A) Substitution

B) Elimination

79) Solving for which variable in which equation involves the least amount of work?

$$x + 9y = 0$$

$$x - 9y = 36$$

A) x in equation 1

B) y in equation 2

C) x in equation 2

D) y in equation 1

Simplify the expression.

$$80) \sqrt{\frac{8}{27}} \cdot \sqrt{\frac{2}{3}}$$

A) $\frac{4}{9}$

B) $\frac{2}{\sqrt{3}}$

C) $\sqrt{\frac{2}{3}}$

D) $\frac{2}{3}$

Simplify. Assume that all variables represent positive real numbers.

$$81) \sqrt{49m^{19}n^4}$$

A) $7m^9n^2$

B) $7m^{10}n^3$

C) $7m^9n^2\sqrt{m}$

D) $7m^8n^2\sqrt{m}$

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

$$82) \sqrt{6} \cdot \sqrt{3} - 4\sqrt{50}$$

A) $6 - 20\sqrt{2}$

B) $-2\sqrt{2}$

C) $9 - 20\sqrt{2}$

D) $-17\sqrt{2}$

$$83) 3\sqrt{27x^2z} + 7x\sqrt{75z}$$

A) $(3\sqrt{27z} + 35\sqrt{3z})x$

B) $44x\sqrt{3z}$

C) $35x\sqrt{3z}$

D) $44\sqrt{3z}$

Rationalize the denominator.

$$84) \frac{4\sqrt{14}}{10\sqrt{5}}$$

A) $\frac{2\sqrt{14}}{25}$

B) $\frac{2\sqrt{14}}{5}$

C) $\frac{2\sqrt{70}}{25}$

D) $\frac{2\sqrt{70}}{5}$

Rationalize the denominator and simplify.

$$85) \frac{3}{9 - \sqrt{5}}$$

A) $\frac{27 + 3\sqrt{5}}{76}$

B) $\frac{27 + 3\sqrt{5}}{-4}$

C) $\frac{27 - 3\sqrt{5}}{76}$

D) $\frac{3}{9} - \frac{3}{\sqrt{5}}$

Solve the equation.

$$86) \sqrt{8q - 7} = 7$$

A) \emptyset

B) {49}

C) $\left\{\frac{21}{4}\right\}$

D) {7}

$$87) \sqrt{p^2 - 3p + 36} = p + 3$$

A) $-\frac{3}{2}$

B) 6

C) 3

D) -3

Simplify each expression by first writing it in radical form.

88) $-32^{1/5}$

A) -2

B) 16

C) 32

D) -8

Solve the problem.

89) Which one of the following is equal to the given expression?

$81^{1/2}$

A) 9

B) $\frac{81}{2}$

C) $-\frac{81}{2}$

D) -9

Rationalize the denominator.

90) $\frac{17}{\sqrt{11}}$

A) $\frac{289}{11}\sqrt{11}$

B) $17\sqrt{11}$

C) $\frac{17}{11}\sqrt{11}$

D) 138

91) $\sqrt{\frac{14p^3r}{7m}}$

A) $\frac{p\sqrt{2pmr}}{m}$

B) $\frac{\sqrt{2pmr}}{m}$

C) $p\sqrt{2pmr}$

D) $\frac{p\sqrt{2pmr}}{7m}$

Find the square root.

92) $\sqrt{\frac{289}{36}}$

A) $\frac{17}{7}$

B) $\frac{17}{6}$

C) 3

D) 8

93) $-\sqrt{36}$

A) -6

B) 6

C) Not a real number

D) -18

Find the length of the unknown side of a right triangle with legs a and b and hypotenuse c. Round to three decimal places, if necessary.

94) $a = 9, b = 12$

A) $c = 12$

B) $c = 11$

C) $c = 14$

D) $c = 15$

Solve the equation. Express radicals in simplest form.

95) $(x - 4)^2 = 49$

A) {53}

B) {11, -3}

C) {7, -7}

D) {-3, -11}

Solve the equation by completing the square.

96) $7x^2 + 4x - 3 = 0$

A) $\left\{\frac{7}{3}, 1\right\}$

B) $\left\{\frac{7}{3}, 0\right\}$

C) $\left\{\frac{7}{3}, -1\right\}$

D) $\left\{\frac{3}{7}, -1\right\}$

Solve the equation. Write radicals in simplified form, and write your answer in lowest terms.

97) $2m^2 + 6m + 2 = 0$

A) $\left\{ \frac{-3 \pm \sqrt{5}}{4} \right\}$

B) $\left\{ \frac{-3 \pm \sqrt{5}}{2} \right\}$

C) $\left\{ \frac{-3 \pm \sqrt{13}}{2} \right\}$

D) $\left\{ \frac{-6 \pm \sqrt{5}}{2} \right\}$

Perform the indicated operation. Give the result in standard form.

98) $(2 - 3i) + (3 + 6i)$

A) $-5 - 3i$

B) $5 - 3i$

C) $5 + 3i$

D) $-1 + 9i$

Find the product.

99) $(2 - 6i)(5 + 8i)$

A) $-38 - 46i$

B) $58 + 14i$

C) $-48i^2 - 14i + 10$

D) $58 - 14i$

Write the quotient in standard form.

100) $\frac{26 + 12i}{3 + i}$

A) $9 + i$

B) $\frac{9}{10} + \frac{6i}{5}$

C) $\frac{3}{8} + \frac{i}{8}$

D) $3 - 1$