

Name _____ Date _____

Solve the equation.

1) $(y - 4) - (y + 5) = 5y$

A) 0

B) $-\frac{9}{2}$

C) $-\frac{9}{5}$

D) $-\frac{9}{4}$

2) $13(8c - 7) = 8c - 9$

A) $\frac{25}{24}$

B) $\frac{41}{48}$

C) $\frac{41}{56}$

D) $-\frac{41}{48}$

3) $3(2z - 4) = 5(z + 5)$

A) -13

B) 37

C) 13

D) 16

4) $2x + 3(-2x - 5) = -16 - 3x$

A) 1

B) 31

C) -1

D) $\frac{31}{7}$

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

A) -30

B) 60

C) 30

D) -60

6) $\frac{17}{14}x + \frac{2}{7} = \frac{8}{7}x$

A) 20

B) -4

C) -20

D) 4

7) $\frac{4(7 - x)}{3} = x$

A) -4

B) $\frac{28}{5}$

C) 4

D) 7

8) $\frac{3(y - 2)}{5} = 1 - 3y$

A) $\frac{7}{6}$

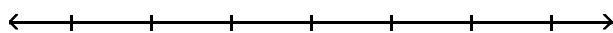
B) $-\frac{11}{18}$

C) $\frac{11}{6}$

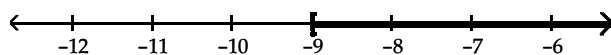
D) $\frac{11}{18}$

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

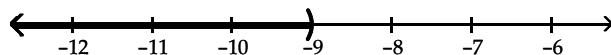
9) $-24x + 8 \leq -4(5x - 11)$



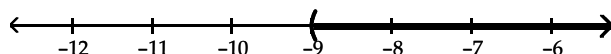
A) $[-9, \infty)$



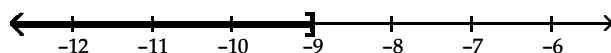
B) $(-\infty, -9)$



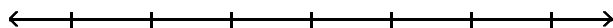
C) $(-9, \infty)$



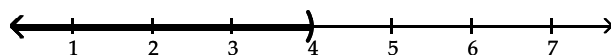
D) $(-\infty, -9]$



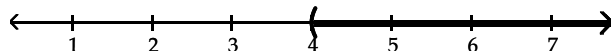
10) $25x + 5 \leq 5(4x + 5)$



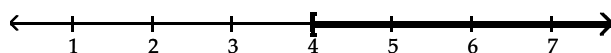
A) $(-\infty, 4)$



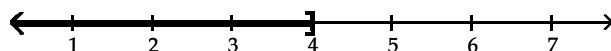
B) $(4, \infty)$



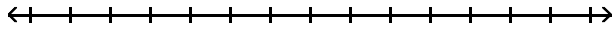
C) $[4, \infty)$



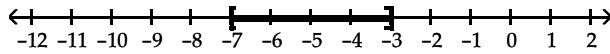
D) $(-\infty, 4]$



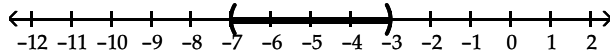
11) $-32 \leq -5x + 3 \leq -12$



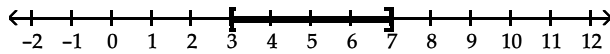
A) $[-7, -3]$



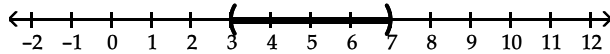
B) $(-7, -3)$



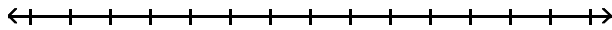
C) $[3, 7]$



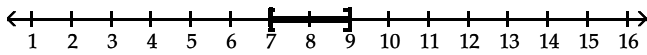
D) $(3, 7)$



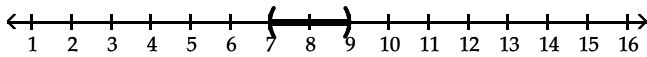
12) $4 \leq 2(x - 5) \leq 8$



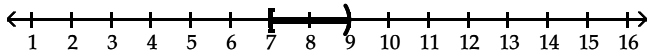
A) $[7, 9]$



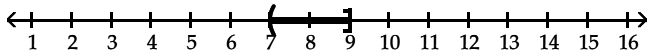
B) $(7, 9)$



C) $[7, 9)$



D) $(7, 9]$



Solve.

- 13) The owners of a candy store want to sell, for \$6 per pound, a mixture of chocolate-covered raisins, which usually sells for \$3 per pound, and chocolate-covered macadamia nuts, which usually sells for \$8 per pound. They have a 40-pound barrel of the raisins. How many pounds of the nuts should they mix with the barrel of raisins so that they hit their target value of \$6 per pound for the mixture?

A) 64 lbs

B) 56 lbs

C) 52 lbs

D) 60 lbs

- 14) A chemist needs 100 milliliters of a 67% solution but has only 55% and 85% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.
- A) 30 ml of 55%; 70 ml of 85% B) 40 ml of 55%; 60 ml of 85%
C) 60 ml of 55%; 40 ml of 85% D) 70 ml of 55%; 30 ml of 85%
- 15) How can \$56,000 be invested, part at 4% annual simple interest and the remainder at 10% annual simple interest, so that the interest earned by the two accounts is equal at the end of the year?
- A) \$40,000 invested at 4%; \$16,000 invested at 10% B) \$30,000 invested at 4%; \$26,000 invested at 10%
C) \$16,000 invested at 4%; \$40,000 invested at 10% D) \$26,000 invested at 4%; \$30,000 invested at 10%
- 16) Melissa invested a sum of money at 3% annual simple interest. She invested three times that sum at 5% annual simple interest. If her total yearly interest from both investments was \$3600, how much was invested at 3%?
- A) \$45,000 B) \$20,000 C) \$135,000 D) \$15,000
- 17) Linda and Dave leave simultaneously from the same starting point biking in opposite directions. Linda bikes at 5 miles per hour and Dave bikes at 9 miles per hour. How long will it be until they are 23 miles apart from each other?
- A) $5\frac{3}{4}$ hrs B) $\frac{14}{23}$ hrs C) $\frac{23}{45}$ hrs D) $1\frac{9}{14}$ hrs
- 18) Jeff starts driving at 55 miles per hour from the same point that Lauren starts driving at 50 miles per hour. They drive in opposite directions, and Lauren has a half-hour head start. How long will they be able to talk on their cell phones that have a 400-mile range?
- A) $3\frac{169}{210}$ hrs B) $3\frac{4}{7}$ hrs C) $3\frac{17}{21}$ hrs D) $4\frac{1}{21}$ hrs
- 19) Eight less than three times a number is less than ten. Find all such numbers.
- A) $x > -\frac{2}{3}$ B) $x < 6$ C) $x < \frac{2}{3}$ D) $x < \frac{34}{3}$
- 20) Three-fourths a number decreased by one is between negative five and sixteen. Find all such numbers.
- A) $\frac{68}{3} < x < -\frac{16}{3}$ B) $-\frac{16}{3} < x < \frac{68}{3}$ C) $8 < x < \frac{68}{3}$ D) $-3 < x < \frac{51}{4}$

Determine whether the equation is a linear equation in two variables.

- 21) $x = 3$
A) yes B) no
- 22) $3x^2 = 7y - 6$
A) no B) yes

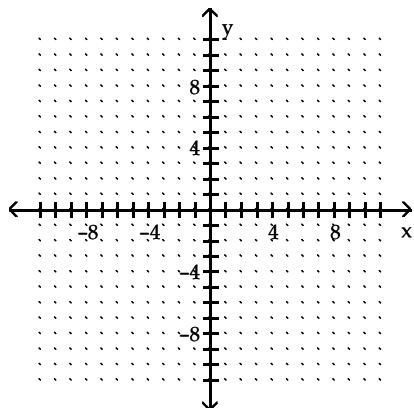
Complete the ordered pair so that it is a solution of the given linear equation.

- 23) $8x + y = -52$; $(-7, \quad)$, $(0, \quad)$, $(1, \quad)$
- A) $(-7, 4)$ $(0, 0)$ $(1, -60)$ B) $(-7, 4)$ $(0, -60)$ $(1, -60)$
C) $(-7, -7)$ $(0, -52)$ $(1, -60)$ D) $(-7, 4)$ $(0, -52)$ $(1, -60)$

Complete the table of ordered pairs for the given linear equation; then plot the solution.

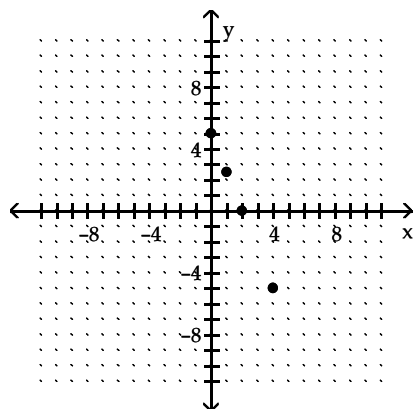
24) $5x + 2y = 10$

x	y
0	
1	



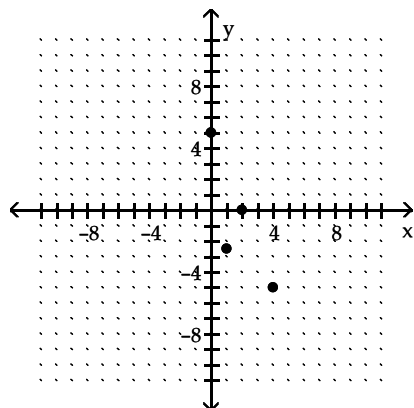
A)

x	y
0	5
2	0
1	2.5
4	-5



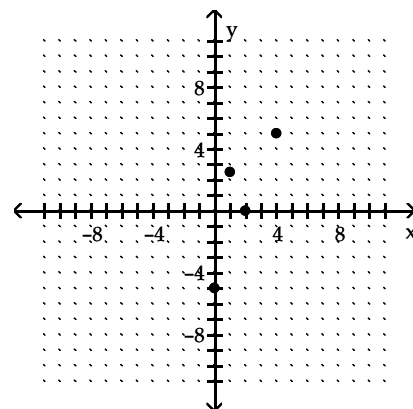
C)

x	y
0	5
2	0
1	-2.5
4	-5



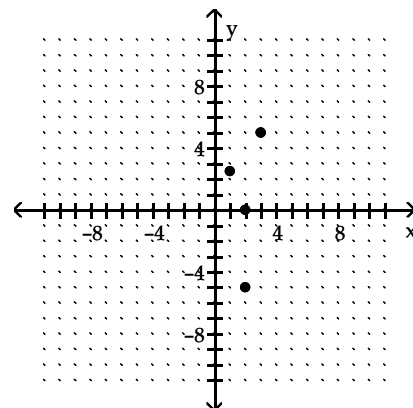
B)

x	y
0	5
2	0
1	2.5
4	-5



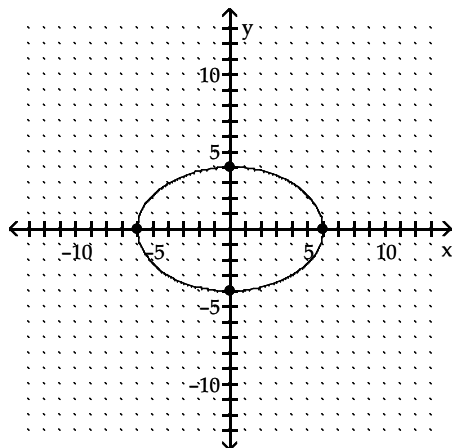
D)

x	y
3	5
2	0
1	2.5
2	-5



Identify the intercepts.

25)



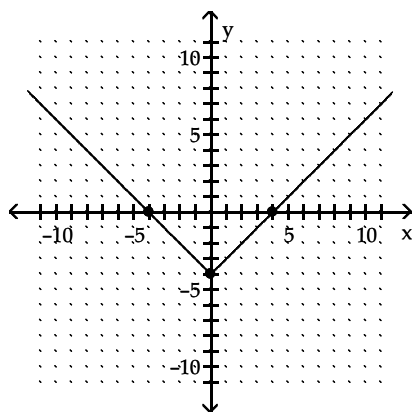
A) $(6, 0), (-6, 0)$

C) $(4, 0), (-4, 0), (0, 6), (0, -6)$

B) $(0, 4), (0, -4)$

D) $(6, 0), (-6, 0), (0, 4), (0, -4)$

26)



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

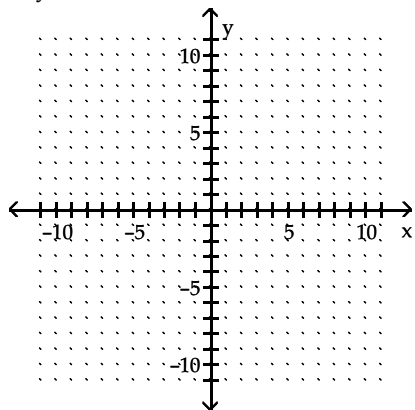
B) $(4, 0), (-4, 0)$

C) $(4, 0), (-4, 0), (0, 0)$

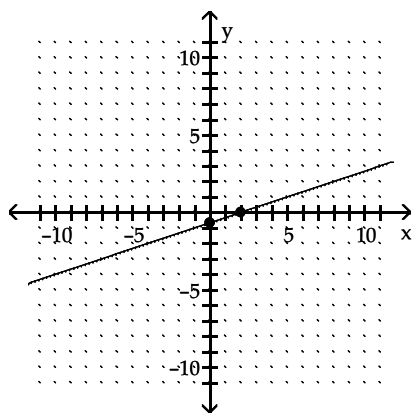
D) $(0, -4)$

Graph the linear equation by finding x- and y- intercepts.

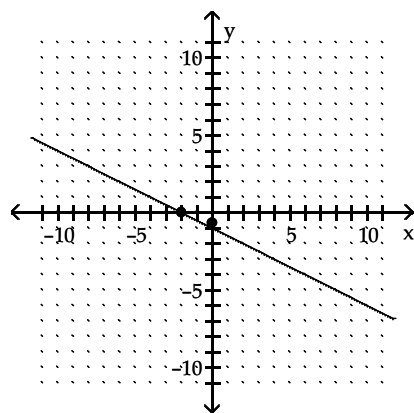
27) $15y - 5x = -10$



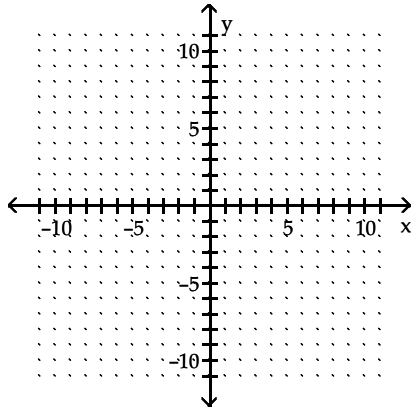
A) $(0, -\frac{2}{3}), (2, 0)$



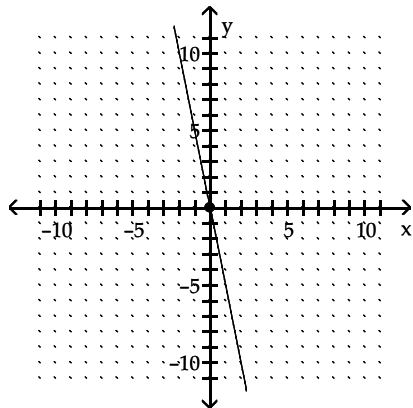
B) $(0, -\frac{2}{3}), (-2, 0)$



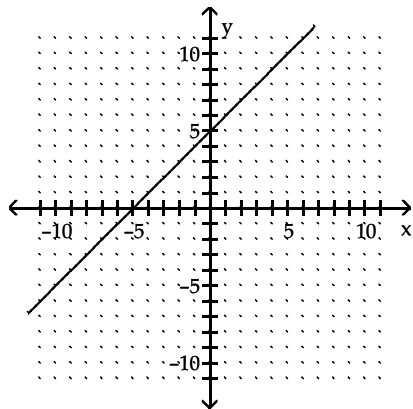
28) $y = 5x$



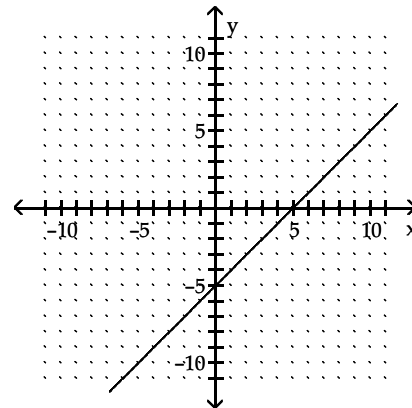
A) $(0, 0)$



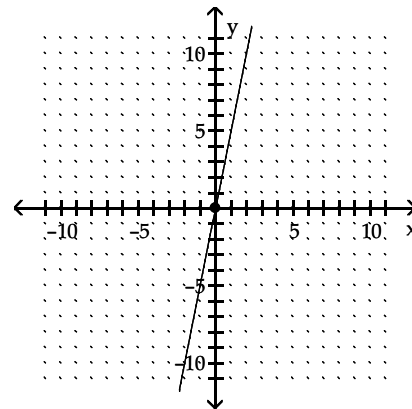
C) $(-5, 0), (0, 5)$



B) $(5, 0), (0, -5)$

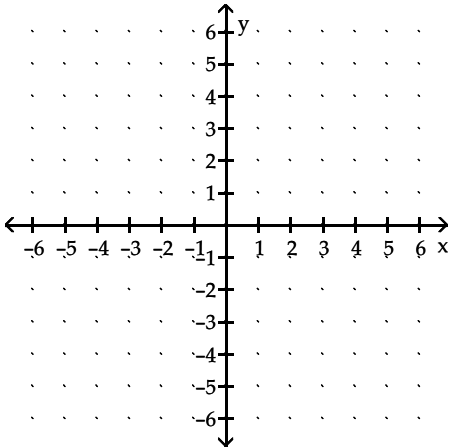


D) $(0, 0)$

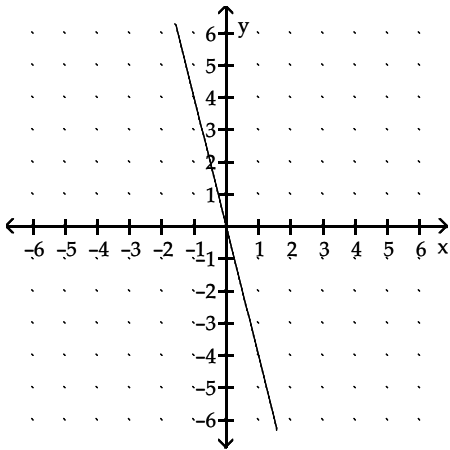


Graph the linear equation.

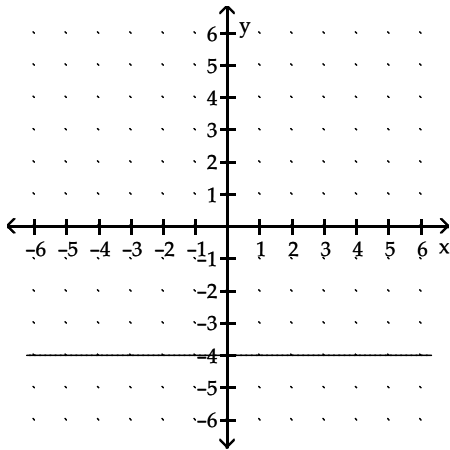
29) $x = -4$



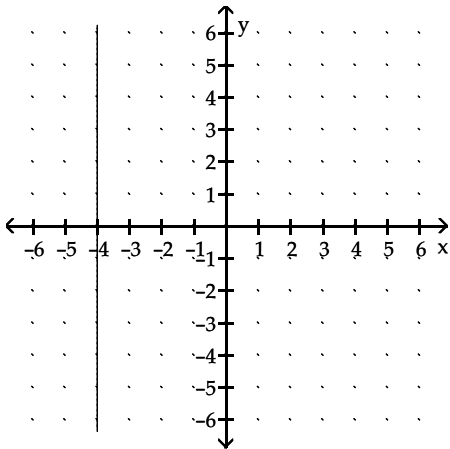
A)



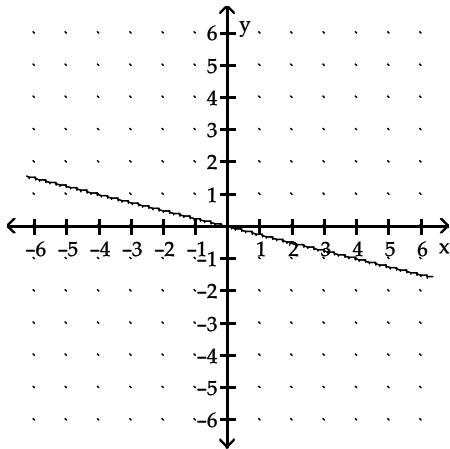
B)



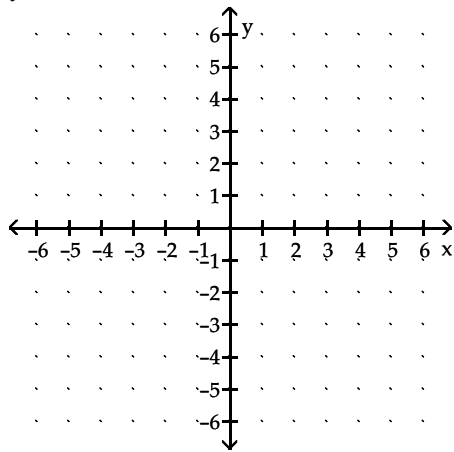
C)



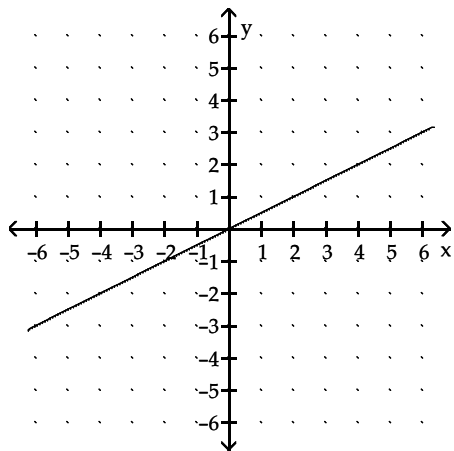
D)



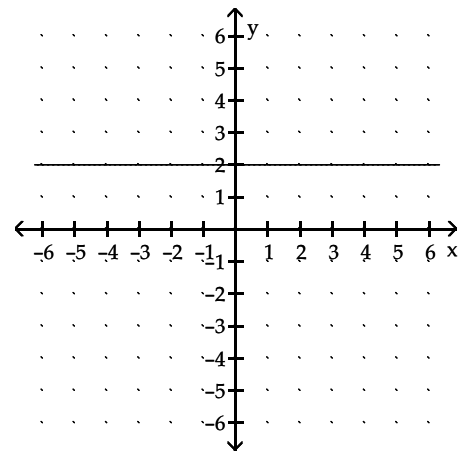
30) $y - 2 = 0$



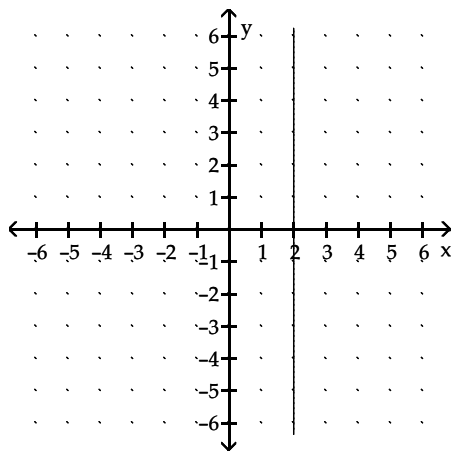
A)



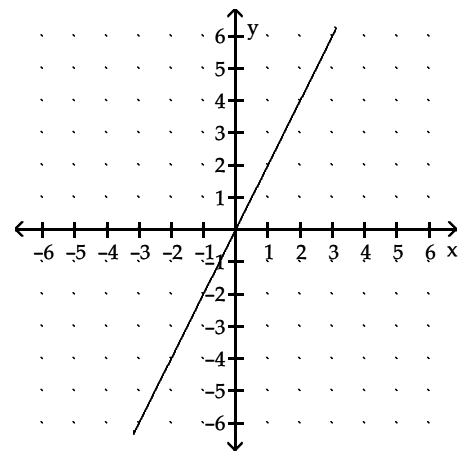
B)



C)

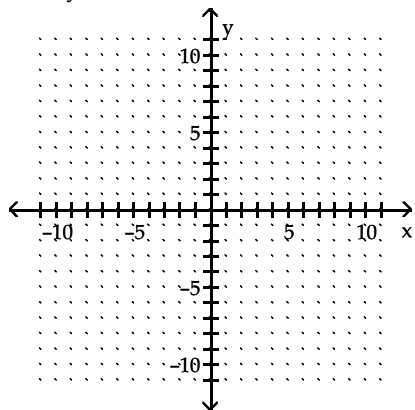


D)

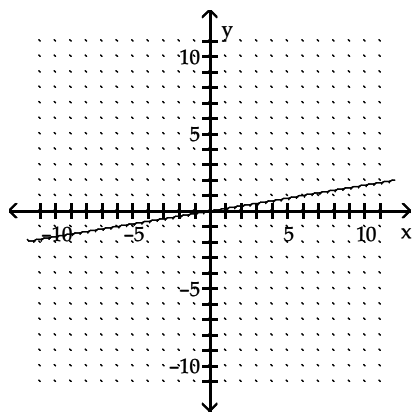


Use the slope-intercept form to graph the equation.

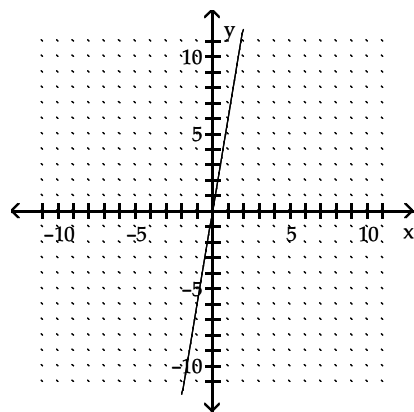
31) $6x + y = 0$



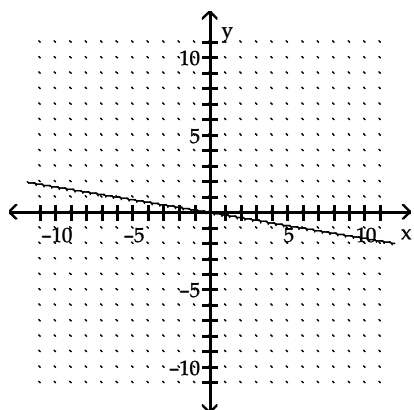
A)



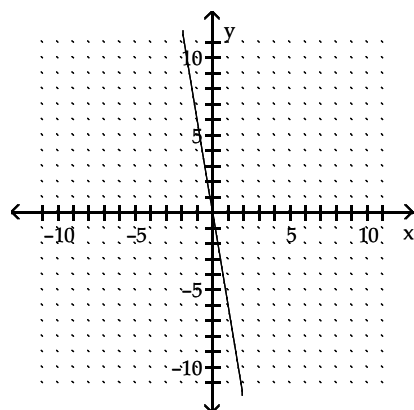
B)



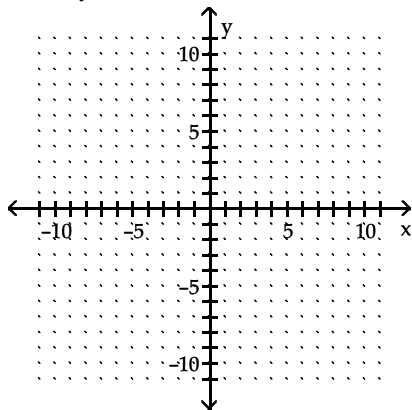
C)



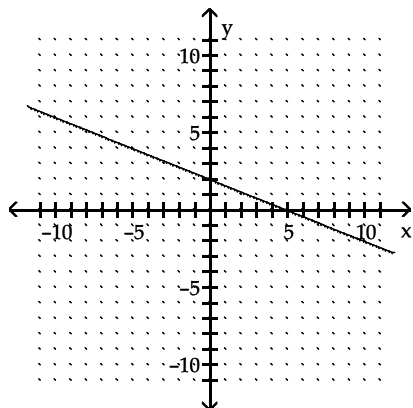
D)



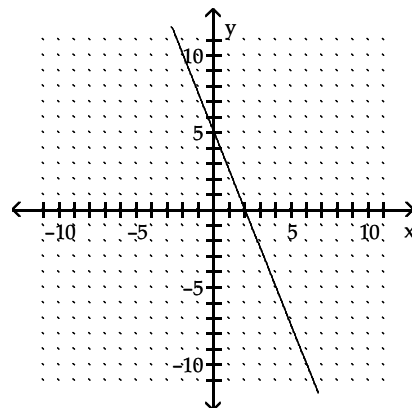
32) $2x + 5y = 10$



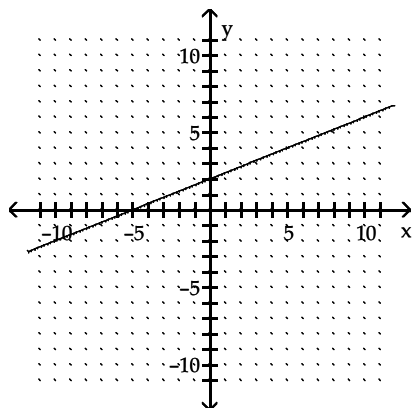
A)



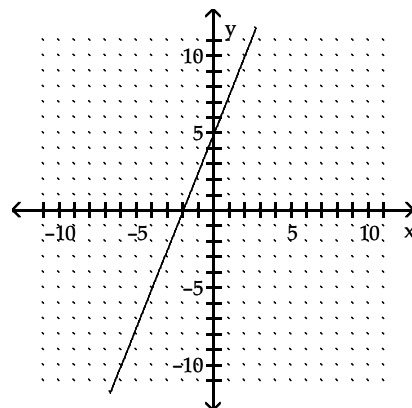
B)



C)



D)



Evaluate the expression with the given replacement values.

33) $-3x^3y$; $x = 2$ and $y = -5$

A) 120

B) 90

C) -120

D) 60

34) $\frac{8}{3x^2}$; $x = -3$

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

B) $\frac{8}{27}$

C) $-\frac{8}{27}$

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

Use the product rule to simplify. Write the results using exponents.

35) $g^9 \cdot g^5 \cdot g^8$

A) g^{14}

B) g^{22}

C) g^{53}

D) g^{13}

36) $(7x)(4x^5)(x^3)$

A) $11x^8$

B) $28x^8$

C) $12x^9$

D) $28x^9$

Use the quotient rule to simplify the expression.

37) $\frac{40m^{16}n^9}{5m^{15}n^7}$

A) $8n^2$

B) $8mn^2$

C) $40mn^2$

D) $8m^{31}n^{16}$

Simplify the following.

38) $-8y^0$

A) -8

B) -7

C) 0

D) 1

Simplify the expression. Write the result using positive exponents only.

39) $\frac{(4x^2)^3}{x^{15}}$

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

B) $\frac{64}{x^9}$

C) $\frac{64}{x^{21}}$

D) $\frac{64}{x^{10}}$

40) $(-5x^3y^{-4})(3x^{-1}y)$

A) $\frac{-15x^4}{y^5}$

B) $\frac{-2x^2}{y^3}$

C) $-15x^2y^5$

D) $\frac{-15x^2}{y^3}$

Find the perimeter.

41)



$(3x + 3)$ units

$(x^2 - x + 12)$ units

A) $(2x^2 + 4x + 15)$ units

B) $(2x^2 + 4x + 30)$ units

C) $(2x^2 + 8x + 30)$ units

D) $(x^2 + 2x + 15)$ units

42)

$(4x + 36)$ units

$(x^2 - x + 9)$ units

$(x^2 + 3)$
units

$(5x + 1)$ units

A) $(x^2 + 8x + 49)$ units

B) $(2x^2 + 10x + 40)$ units

C) $(2x^2 + 8x + 49)$ units

D) $(2x^2 + 10x + 49)$ units

Perform the indicated operations.

43) $(6x^5 + 2x^4 - 7x^3 + 6) - (4x^5 - 4x^4 - 5x^3 - 5)$

A) $2x^5 - 2x^4 - 12x^3 + 1$

C) $10x^5 - 2x^4 - 12x^3 + 1$

B) $2x^5 + 6x^4 - 2x^3 + 11$

D) $10x^5 - 2x^4 - 12x^3 + 11$

44) $(-7x^4 + 9x^6 - 8 + 9x^5) - (-5 + 5x^5 + 2x^6 + 9x^4)$

A) $11x^6 + 14x^5 + 2x^4 - 13$

C) $7x^6 + 14x^5 + 2x^4 - 13$

B) $7x^6 + 4x^5 - 16x^4 - 3$

D) $11x^6 + 14x^5 + 2x^4 - 3$

Find the following product.

45) $(3z + 11)^2$

A) $3z^2 + 66z + 121$

B) $9z^2 + 121$

C) $9z^2 + 66z + 121$

D) $3z^2 + 121$

46) $(x + 1)(x^2 - x + 1)$

A) $x^3 + 2x^2 + 2x + 1$

B) $x^3 - 2x^2 - 2x - 1$

C) $x^3 + 1$

D) $x^3 - 1$

Perform the division.

47) $\frac{x^2 + 7x + 3}{x + 5}$

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

B) $x + 2 + \frac{7}{x + 5}$

C) $x + 2 - \frac{7}{x + 5}$

D) $x + 3$

48) $\frac{8x^3 - 28x^2 + 14x + 19}{2x - 5}$

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

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

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

D) $4x^2 - 4x - 3$

Factor out the GCF from the polynomial.

49) $48x - 8$

A) $8x(6x - 1)$

B) $8x(6 - 1)$

C) $8(x - 6)$

D) $8(6x - 1)$

50) $21x^3y + 15xy^6$

A) $3y(7x^3 + 5xy^5)$

B) $3x(7x^2y + 5y^6)$

C) $xy(21x^2 + 15y^5)$

D) $3xy(7x^2 + 5y^5)$

Factor by grouping.

51) $xy + 11x - 5y - 55$

A) $(x - 11)(y + 5)$

B) $(y + 11)(x - 5)$

C) $(y - 11)(x + 5)$

D) $(x + 11)(y - 5)$

52) $4xy - 16x + 7y - 28$

A) $(4x + y)(7y - 4)$

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

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

D) $(4x + 7y)(y - 4)$

Factor the polynomial completely. If the polynomial cannot be factored, write prime.

53) $x^3 - x^2 - 30x$

A) $x(x + 6)(x - 5)$

B) $(x^2 + 1)(x - 30)$

C) $x(x + 5)(x - 6)$

D) prime

- 54) $5x^6 + 60x^5 + 175x^4$
 A) $x^4(x + 7)(5x + 25)$ B) $5x^4(x^2 + 12x + 35)$ C) $5x^4(x + 7)(x + 5)$ D) $x^4(5x + 35)(x + 5)$
- 55) $x^2 - 16xy + 64y^2$
 A) $(x - 8y)(x + 8y)$ B) $(x - 8y)^2$ C) $(x + 8y)^2$ D) prime
- 56) $64x^2 + 80xy + 25y^2$
 A) $(64x + y)(x + 25y)$ B) $(8x - 5y)^2$ C) $(8x + 5y)(8x - 5y)$ D) $(8x + 5y)^2$
- 57) $r^{20} - a^2$
 A) $(r^{10} + a)(r^{10} - a)$ B) $(r^{10} - a)^2$ C) $(r^{10} + a)^2$ D) prime
- 58) $x^4 - 625$
 A) $(x^2 + 25)(x^2 + 25)$ B) $(x^2 - 25)(x^2 - 25)$
 C) $(x^2 + 25)(x + 5)(x - 5)$ D) prime
- 59) $t^3 + 1000$
 A) $(t - 10)(t^2 + 10t + 100)$ B) $(t - 1000)(t + 1)(t - 1)$
 C) $(t + 10)(t^2 + 100)$ D) $(t + 10)(t^2 - 10t + 100)$
- 60) $750x^3 - 162x^6$
 A) $6(5x + 3x^2)(25x^2 - 15x^3 + 9x^4)$ B) $6(5x - 3x^2)(25x^2 + 15x^3 + 9x^4)$
 C) $6x^3(5 - 3x)(25 + 9x^2)$ D) $6x^3(5 - 3x)(25 + 15x + 9x^2)$

Solve the equation.

- 61) $(5y + 29)(2y + 11) = 0$
 A) $y = 24, y = 9$ B) $y = \frac{29}{5}, y = \frac{11}{2}$ C) $y = -\frac{29}{5}, y = -\frac{11}{2}$ D) $y = -\frac{5}{24}, y = -\frac{2}{11}$
- 62) $b(b + 18) = 0$
 A) $b = -1, b = -18$ B) $b = 18, b = 0$ C) $b = -18, b = 0$ D) $b = 1, b = -18$
- 63) $49x^2 - 3 = 14x$
 A) $x = -\frac{3}{7}, x = \frac{1}{7}$ B) $x = \frac{3}{7}, x = -\frac{1}{7}$ C) $x = -\frac{1}{49}, x = -\frac{2}{49}$ D) $x = \frac{3}{49}, x = -\frac{1}{49}$
- 64) $(x + 8)(x + 1) = 44$
 A) $x = -3, x = 12$ B) $x = -8, x = -1$ C) $x = -12, x = 3$ D) $x = 1, x = 8$

Without graphing, determine whether the system has one solution, no solution, or an infinite number of solutions.

- 65)
$$\begin{cases} 2x + y = 2 \\ 2x + y = 4 \end{cases}$$

 A) infinite number of solutions B) one solution C) no solution

66)

$$\begin{cases} x + 6y = 24 \\ y = -\frac{1}{6}x + 4 \end{cases}$$

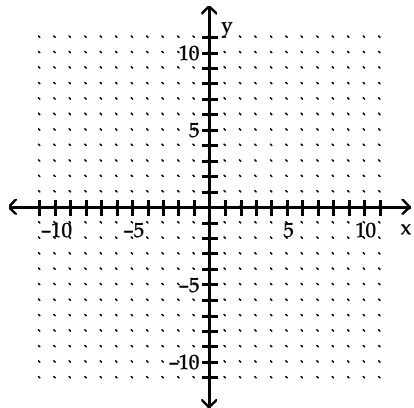
A) no solution

B) infinite number of solutions

C) one solution

Solve the system of equations by graphing the equations on the same set of axes.

67) $\begin{cases} x + y = 1 \\ x - y = 5 \end{cases}$



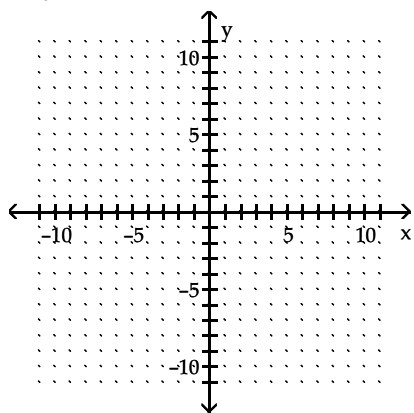
A) (-2, 3)

B) (3, -2)

C) (3, 2)

D) no solution

68) $\begin{cases} x + 2y = 5 \\ 3x - 2y = -9 \end{cases}$



A) (-1, -3)

B) (3, -1)

C) (-1, 3)

D) no solution

Solve the system of equations by the substitution method.

69)

$$\begin{cases} 3x + y = 15 \\ 12x + 4y = 60 \end{cases}$$

A) (0, 15)

B) (5, 0)

C) infinite number of solutions

D) no solution

70)

$$\begin{cases} -5x - 20y = 10 \\ 6x + 24y = 0 \end{cases}$$

A) (10, 0)

C) infinite number of solutions

B) (0, 10)

D) no solution

Solve the system of equations by the addition method.

71)

$$\begin{cases} 3x - 5y = 7 \\ 6x - 10y = 28 \end{cases}$$

A) (7, 28)

B) (2, 4)

C) $(\frac{35}{9}, -\frac{7}{3})$

D) no solution

72)

$$\begin{cases} -6x - 6y = -4 \\ 12x + 12y = 8 \end{cases}$$

A) (0, 0)

C) infinite number of solutions

B) (-6, -6)

D) no solution

Simplify the rational expression.

73) $\frac{2x - 8}{12 - 3x}$

A) 4

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

C) -4

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

74) $\frac{4 - x}{6x - 24}$

A) -6

B) $-\frac{1}{6}$

C) 6

D) $\frac{1}{6}$ **Perform the indicated operation. Simplify if possible.**

75) $\frac{2x}{x^2 - 7x + 12} - \frac{8}{x^2 - 7x + 12}$

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

76) $\frac{10x + 3}{x^2 + 10x + 16} - \frac{9x - 5}{x^2 + 10x + 16}$

A) $\frac{1}{x^2 + 10x + 16}$ B) $\frac{1}{x + 2}$ C) $\frac{1}{x + 8}$ D) $\frac{x - 8}{x^2 + 10x + 16}$ **Divide. Simplify if possible.**

77) $\frac{x - 1}{-7 - x} \div \frac{x^2 - 4x - 5}{x^2 + 8x + 7}$

A) $-\frac{x - 1}{x - 5}$ B) $-\frac{(x - 1)(x + 1)}{(x + 7)^2}$ C) $\frac{x + 1}{x - 5}$ D) $-\frac{x + 1}{x - 5}$

$$78) (x+2) \div \frac{x^2 - 10x + 16}{8 - x}$$

A) -1

B) $-\frac{x-2}{x+2}$

C) $-(x-2)(x+2)$

D) $-\frac{x+2}{x-2}$

Find all numbers for which the rational function is defined.

$$79) f(w) = \frac{w^2 - 25w}{5w}$$

A) $\{w \mid w \text{ is a real number and } w \neq 0 \text{ and } w \neq 25\}$

B) $\{w \mid w \text{ is a real number and } w \neq 5\}$

C) $\{w \mid w \text{ is a real number and } w \neq \frac{1}{5}\}$

D) $\{w \mid w \text{ is a real number and } w \neq 0\}$

$$80) f(x) = \frac{2x}{-3 + x}$$

A) $\{x \mid x \text{ is a real number and } x \neq 0\}$

B) $\{x \mid x \text{ is a real number and } x \neq 3\}$

C) $\{x \mid x \text{ is a real number and } x \neq 0, x \neq 3\}$

D) $\{x \mid x \text{ is a real number and } x \neq -3\}$

Answer Key

Testname: DEPARTMENTAL FINAL REVIEW 0308

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

Answer Key

Testname: DEPARTMENTAL FINAL REVIEW 0308

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