

Name: \_\_\_\_\_ Period: \_\_\_\_\_

## Final Review A

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

**Simplify the expression.**

- \_\_\_\_\_ 1.  $-6 - 7(c + 10)$   
a.  $64 - 7c$                       b.  $-76 - 7c$                       c.  $4 - 13c$                       d.  $-16 - 13c$
- \_\_\_\_\_ 2.  $5k^2(-6k^2 - 2k + 6)$   
a.  $-30k^3 + 3k^2 + 30k$                       c.  $-k^4 + 3k^3 + 11k^2$   
b.  $30k^4 - 10k^3 + 11k^2$                       d.  $-30k^4 - 10k^3 + 30k^2$

**Simplify the product.**

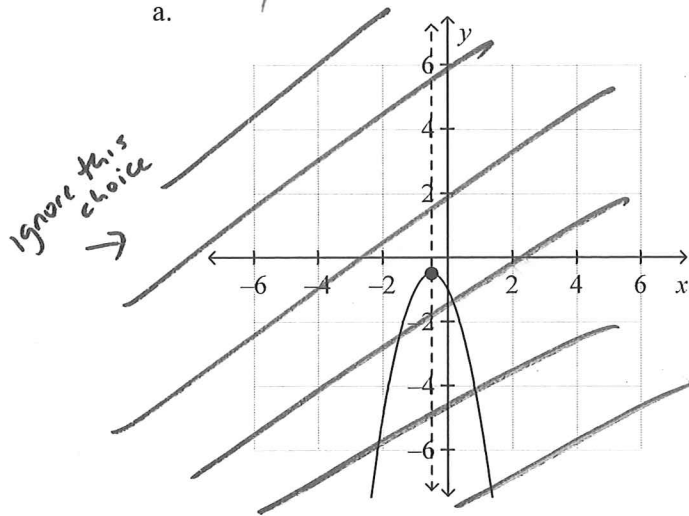
- \_\_\_\_\_ 3.  $(x - 4)(x + 3)$   
a.  $x^2 - 7x - 12$                       c.  $x^2 - x - 12$   
b.  $x^2 + x - 12$                       d.  $x^2 - 12x - 1$
- \_\_\_\_\_ 4. The base of a triangle is  $(6h + 16)$  centimeters. The height of the triangle is  $(3h - 8)$  centimeters. Find the area of the triangle.  
a.  $(18h^2 - 96h - 64) \text{ cm}^2$                       c.  $(18h^2 + 64) \text{ cm}^2$   
b.  $(9h^2 - 16h - 64) \text{ cm}^2$                       d.  $(9h^2 - 64) \text{ cm}^2$

**Factor the expression.**

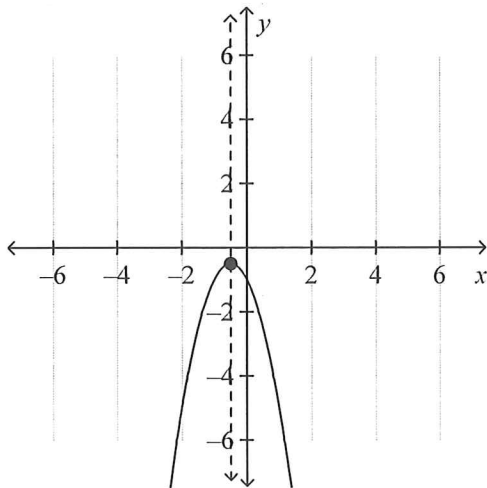
- \_\_\_\_\_ 5.  $k^2 - 16h^2$   
a.  $(k + 4h)(k + 4h)$                       c.  $h^2(k + 4)(k - 4)$   
b.  $(k - 4h^2)(k + 4)$                       d.  $(k + 4h)(k - 4h)$
- \_\_\_\_\_ 6.  $a^2 + ab - 56b^2$   
a.  $(a + 8b)(a + 7b)$                       c.  $(a + 8b)(a - 7b)$   
b.  $(a - 8)(a + 7b)$                       d.  $(a - 8b)(a - 7b)$
- \_\_\_\_\_ 7.  $40p^2 - 13p - 36$   
a.  $(8p + 9)(5p + 4)$                       c.  $(8p - 9)(5p + 4)$   
b.  $(8p - 9)(5p - 4)$                       d.  $(8p + 9)(5p - 4)$

8. Graph  $y = -2x^2 - 2x - 1$ . Label the axis of symmetry and vertex.

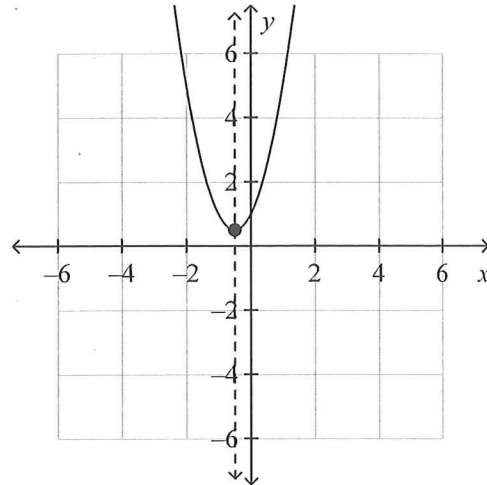
a.

Axis of symmetry:  $x = -0.5$ Vertex:  $(-0.5, 0.5)$ 

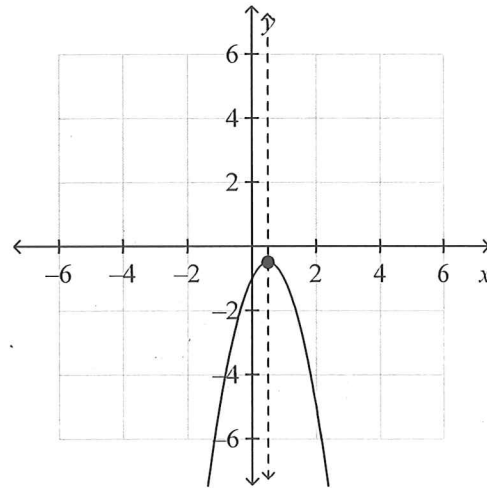
b.

Axis of symmetry:  $x = -0.5$ Vertex:  $(-0.5, -0.5)$ 

c.

Axis of symmetry:  $x = -0.5$ Vertex:  $(-0.5, 0.5)$ 

d.

Axis of symmetry:  $x = 0.5$ Vertex:  $(0.5, -0.5)$ 

9.

A ball is thrown into the air with an upward velocity of 36 ft/s. Its height  $h$  in feet after  $t$  seconds is given by the function  $h = -16t^2 + 36t + 9$ .

a. In how many seconds does the ball reach its maximum height? Round to the nearest hundredth if necessary.

b. What is the ball's maximum height?

a. 1.13 s; 69.75 ft    b. 1.13 s; 29.25 ft    c. 1.13 s; 31.5 ft    d. 2.25 s; 9 ft

10. Write  $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$  using an exponent.

a.  $9 \cdot 7$     b.  $7^9$     c.  $99^7$     d.  $9^7$

- \_\_\_\_\_ 11. Suppose the population of a town is 2,700 and is growing 4% each year.
- Write an equation to model the population growth.
  - Predict the population after 12 years.
- $y = 4 \cdot 2,700^x$ ; about 129,600 people
  - $y = 2,700 \cdot 4^x$ ; about 4,323 people
  - $y = 2,700 \cdot 1.04^x$ ; about 4,323 people
  - $y = 2,700 \cdot 4^x$ ; about 45,298,483,200 people
- \_\_\_\_\_ 12. You deposit \$400 in an account that earns 6% compounded annually (once per year). What is the balance in your account after 5 years? Round your answer to the nearest cent.
- \$535.29
  - \$2,120.00
  - \$520.00
  - \$693.56
- \_\_\_\_\_ 13. A boat costs \$15,500 and decreases in value by 10% per year. How much will the boat be worth after 5 years?
- \$9,152.6
  - \$15,450
  - \$8,237.34
  - \$24,962.91

**Write the expression using a single exponent.**

- \_\_\_\_\_ 14.  $2^2 \cdot 2^8$
- $4^{10}$
  - $2^{10}$
  - $4^{16}$
  - $2^{16}$
- \_\_\_\_\_ 15.  $6^a \cdot 6^v$
- $6^{a+v}$
  - $6^{av}$
  - $36^{av}$
  - $36^{a+v}$
- \_\_\_\_\_ 16.  $\frac{144^{14}}{144^2}$
- $144^{16}$
  - $144^{12}$
  - $144^{28}$
  - $144^{\frac{14}{2}}$
- \_\_\_\_\_ 17.  $\frac{x^{13}}{x^2}$
- $x^{\frac{13}{2}}$
  - $x^{15}$
  - $x^{11}$
  - $x^{26}$

**Simplify the expression.**

- \_\_\_\_\_ 18.  $14^{-4}$
- $\frac{1}{14^4}$
  - 56
  - $\frac{1}{14}$
  - $\frac{1}{14^{-4}}$

**Write the number in standard form.**

- \_\_\_\_\_ 19. A cell has an approximate diameter of  $3.656 \times 10^{-5}$  millimeters.
- 0.0003656
  - 0.0000003656
  - 0.000003656
  - 0.00003656

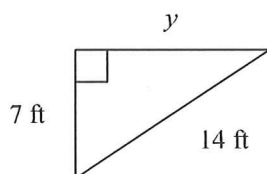
20. A scientist uses a spherical particle in an experiment. The diameter of Particle A is  $3.09 \times 10^{-5}$  centimeters.
- Write the diameter of Particle A in standard form.
  - What is the radius of Particle A? Express your answer in standard form.
- 0.0000309; 0.00001545 cm
  - 0.000309; 0.0000618 cm
  - 0.0000309; 0.0000618 cm
  - 0.000309; 0.00001545 cm

**Simplify the square root.**

21.  $\sqrt{16}$
- 16
  - 0.4
  - 40
  - 4
22.  $-\sqrt{25}$
- 0.5
  - 5
  - 5
  - 25

**In the given right triangle, find the missing length to the nearest tenth.**

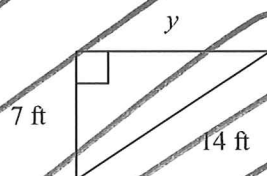
23.



Not drawn to scale

- 3.7 ft
- 15.7 ft
- 5.9 ft
- 12.1 ft

24.



Not drawn to scale

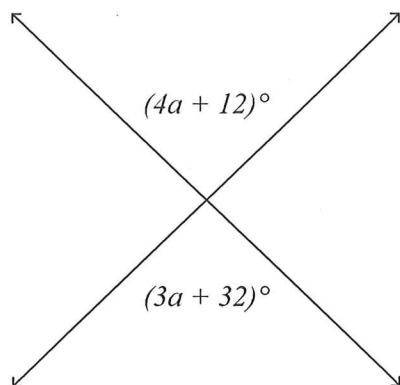
- 5.9 ft
  - 12.1 ft
25. Ingrid is making a quilt using squares that measure 5 in. on a side. What is the length of a diagonal of one of the quilt squares? Round to the nearest tenth.
- 8.7 in.
  - 7.1 in.
  - 3.5 in.
  - 14.2 in.

**Simplify the expression.**

- \_\_\_\_\_ 26.  $(-2)^5$   
a. -32                      b. 16                      c. -10                      d. 32
- \_\_\_\_\_ 27.  $-5^4$   
a. 20                      b. 125                      c. -625                      d. 625

**Solve the equation.**

- \_\_\_\_\_ 28.  $8d - 4d - 6d - 8 = 2d$   
a. 0                      b. -1                      c. -2                      d. -4
- \_\_\_\_\_ 29.  $37 - 18 + 8w = 67$   
a. -6                      b. 4                      c. 7                      d. 6
- \_\_\_\_\_ 30. a. Find the value of  $a$ .  
b. Find the value of the marked angles.



not drawn to scale

- a. 22;  $100^\circ$                       b. 19;  $88^\circ$                       c. 20;  $92^\circ$                       d. 24;  $108^\circ$

**Solve the equation.**

- \_\_\_\_\_ 31.  $78 = -2(m + 3) + m$   
a. -28                      b. -42                      c. -72                      d. -84
- \_\_\_\_\_ 32.  $\frac{y - 5}{3} = 1$   
a. -2                      b. 8                      c. 18                      d. 6
- \_\_\_\_\_ 33.  $\frac{w}{4} - 4 = 3$   
a. -4                      b. 28                      c. 3                      d. 11

\_\_\_\_ 34.  $\frac{d}{3} + 10 = 7$

- a. 51                      b. 20                      c. 0                      d. -9

\_\_\_\_ 35.  $-4n + 7 + 2n = 1$

- a. 1                      b. 3                      c. -3                      d. 4

**Factor the polynomial.**

\_\_\_\_ 36.  $24w^{12} + 64w^8$

- a.
- $8w^8(3w^4 + 8)$
- c.
- $8(3w^{12} + 8w^8)$
- 
- b.
- $w^8(24w^4 + 64)$
- d.
- $8w^7(3w^5 + 8w)$

**Solve the equation by factoring.**

\_\_\_\_ 37.  $z^2 - 6z - 27 = 0$

- a.
- $z = 3$
- or
- $z = 9$
- c.
- $z = -3$
- or
- $z = 9$
- 
- b.
- $z = 3$
- or
- $z = -9$
- d.
- $z = -3$
- or
- $z = -9$

\_\_\_\_ 38.  $3z^2 + 3z - 6 = 0$

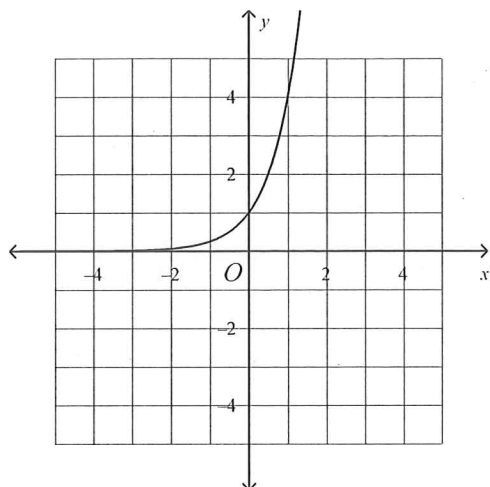
- a.
- $z = 1$
- or
- $z = -2$
- c.
- $z = 3$
- or
- $z = -2$
- 
- b.
- $z = 1$
- or
- $z = 2$
- d.
- $z = 3$
- or
- $z = 2$

\_\_\_\_ 39.  $c^2 - 4c = 0$

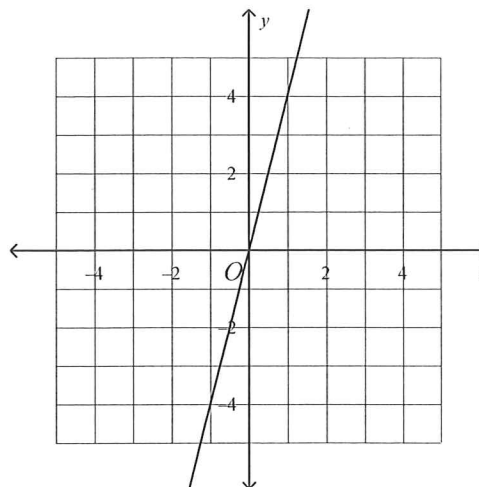
- a.
- $c = 0$
- or
- $c = -4$
- c.
- $c = 0$
- or
- $c = 4$
- 
- b.
- $c = 0$
- or
- $c = \sqrt{4}$
- d.
- $c = 1$
- or
- $c = -\sqrt{4}$

\_\_\_\_\_ 40. Graph the function  $y = 4^x$ .

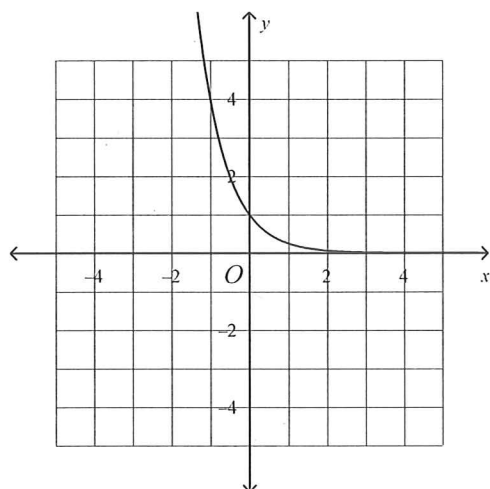
a.



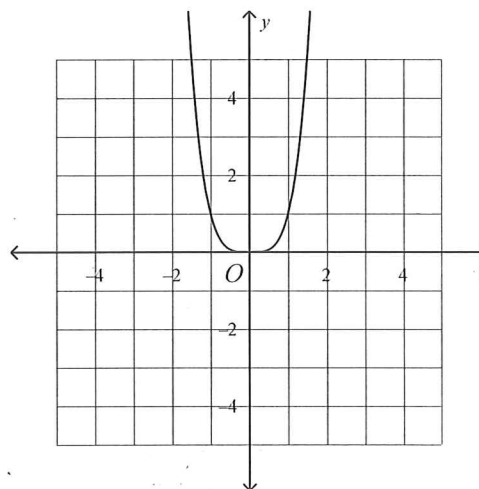
c.



b.



d.



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

\_\_\_\_\_ 41.  $m = 1, b = 4$

a.  $y = 4x + 1$

c.  $y = -1x + 4$

b.  $y = x - 4$

d.  $y = x + 4$

Is the second equation parallel to the first equation?

\_\_\_\_\_ 42.  $y = \frac{1}{6}x + 8$

$-2x + 12y = -11$

a. Yes, since the slope are the same and the y-intercepts are the same.

b. No, since the y-intercepts are different.

c. Yes, since the slope are the same and the y-intercepts are different.

d. No, since the slopes are different.

Write an equation for the line that is parallel to the given line and that passes through the given point.

\_\_\_\_\_ 43.  $y = \frac{3}{4}x - 9$ ;  $(-8, -18)$

a.  $y = \frac{3}{4}x + \frac{11}{2}$

c.  $y = \frac{3}{4}x - 12$

b.  $y = \frac{4}{3}x - 12$

d.  $y = -\frac{4}{3}x + 12$

\_\_\_\_\_ 44. Find the perimeter of a right triangle with legs of 20 cm and 21 cm.

a. 882 cm

b. 82 cm

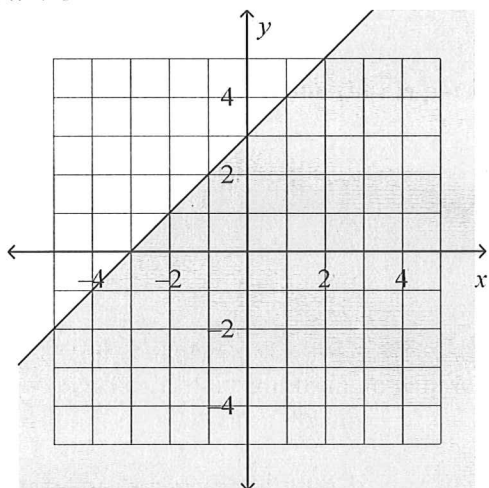
c. 70 cm

d. 47 cm

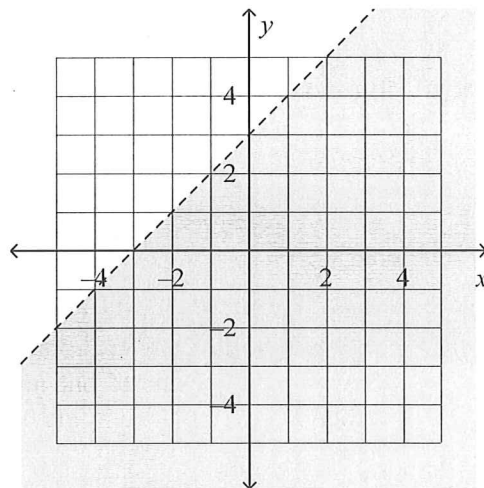
**Graph the inequality on a coordinate plane.**

\_\_\_\_\_ 45.  $y < x + 3$

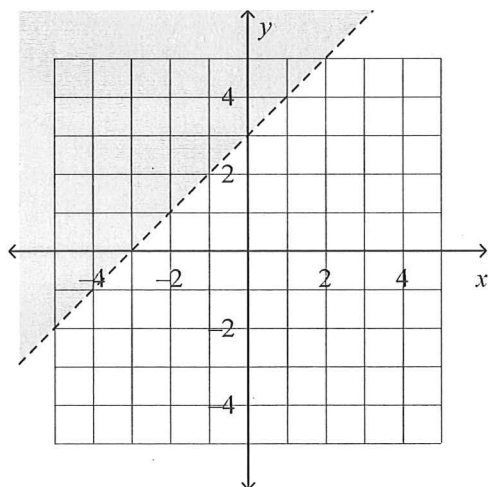
a.



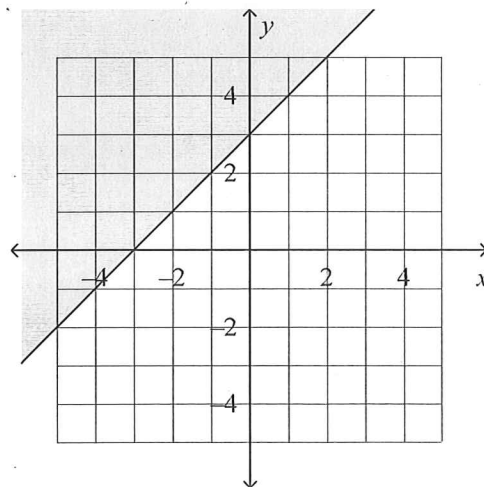
c.



b.

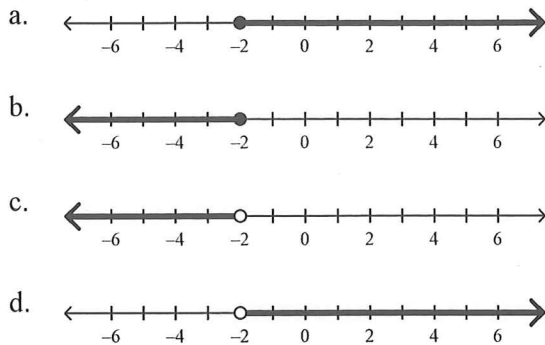


d.





\_\_\_\_\_ 46. Graph the inequality:  $x \leq -2$ .



**Solve the inequality.**

\_\_\_\_\_ 47.  $-7p - 16 > 82$

- a.  $p < -9$                       b.  $p < -14$                       c.  $p > -14$                       d.  $p > 9$

\_\_\_\_\_ 48.  $\frac{w}{-15} - 13 \geq 8$

- a.  $w \leq -75$                       b.  $w \geq 315$                       c.  $w \leq -315$                       d.  $w \geq 75$

**Write and solve an inequality.**

\_\_\_\_\_ 49. The daily cost of renting a car is \$21 plus \$.53 per mile. Jane's budget allows her to spend a maximum of \$96.00 for a 1-day rental. How many miles  $m$  may Jane drive the rental car in one day without exceeding her budget of \$96.00?

- a.  $21 \geq 96.00 - 0.50m$ ; 150 or fewer miles  
 b.  $0.50m + 21 > 96.00$ ; 150 or more miles  
 c.  $96.00 \geq 21 + 0.50m$ ; 150 or more miles  
 d.  $0.50m + 21 \leq 96.00$ ; 150 or fewer miles

\_\_\_\_\_ 50. Levi earns \$6.25 per hour working after school. He needs at least \$143.75 for a stereo system. How many hours  $h$  does he need to work to reach his goal?

- a.  $\frac{h}{6.25} > 143.75$ ;  $h > 23$ ; 23 hours                      c.  $\frac{h}{6.25} < 143.75$ ;  $h < 23$ ; 23 hours  
 b.  $6.25h \leq 143.75$ ;  $h \leq 23$ ; 23 hours                      d.  $6.25h \geq 143.75$ ;  $h \geq 23$ ; 23 hours

\_\_\_\_\_ 51. What is the solution of the following system of equations?

$$y = -4x + 7$$

$$y = -x + 4$$

- a. (4, 0)                      b. (1, 3)                      c. (-3, 19)                      d. (0, 7)

**Find the  $x$ - and  $y$ -intercept of the line.**

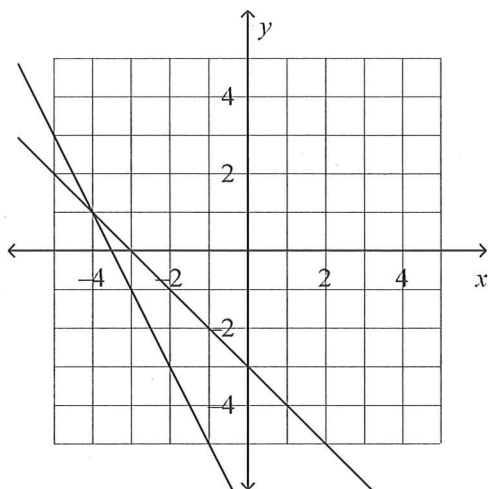
\_\_\_\_\_ 52.  $-3x + 9y = 18$

- a.  $x$ -intercept is 2;  $y$ -intercept is -6.                      c.  $x$ -intercept is -6;  $y$ -intercept is 2.  
 b.  $x$ -intercept is -3;  $y$ -intercept is 9.                      d.  $x$ -intercept is 9;  $y$ -intercept is -3.

Solve the system of equations by graphing.

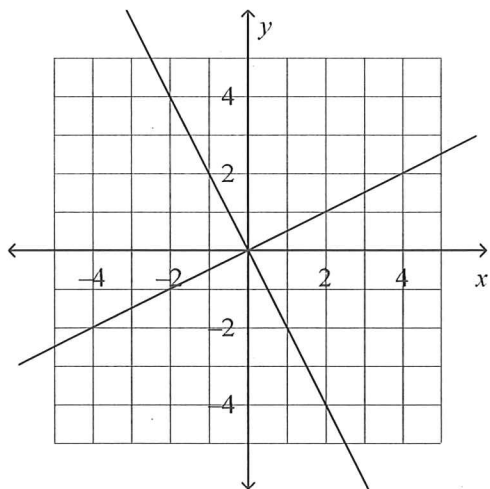
53.  $y = \frac{1}{2}x + 3$   
 $y = -2x - 7$

a.



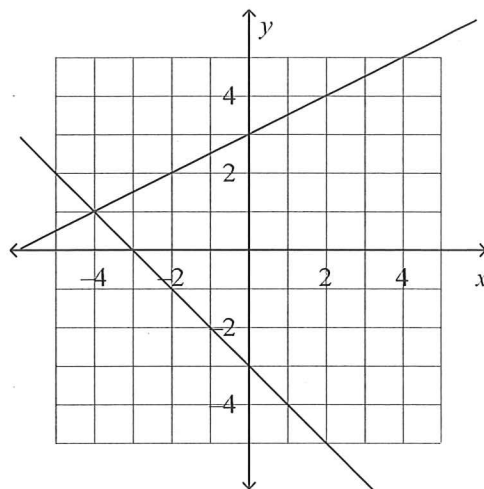
$(-4, 1)$

b.



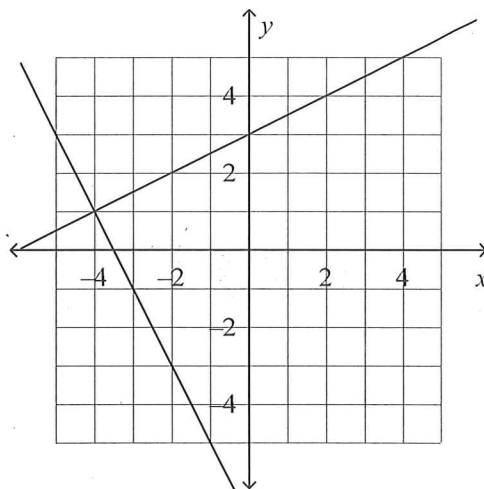
$(0, 0)$

c.



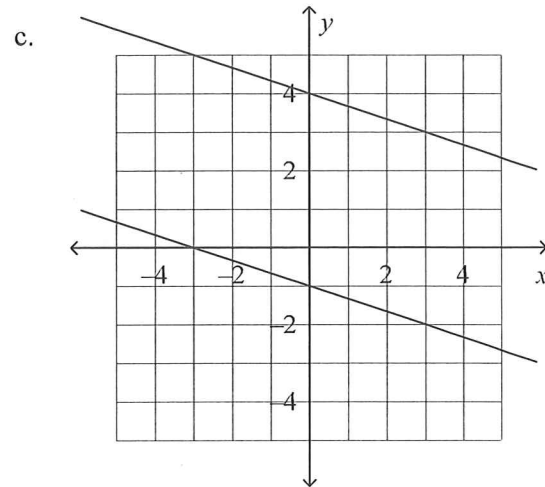
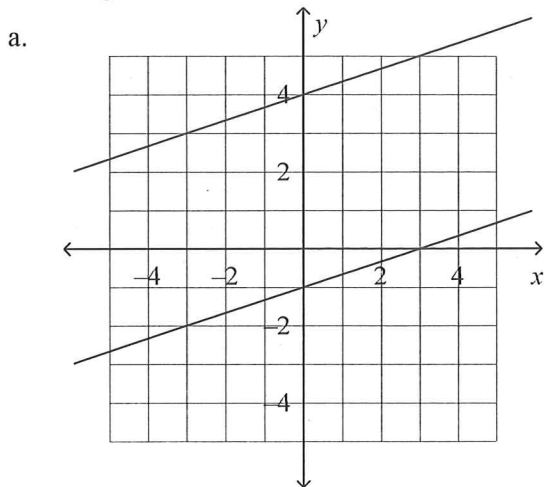
$(-4, 1)$

d.

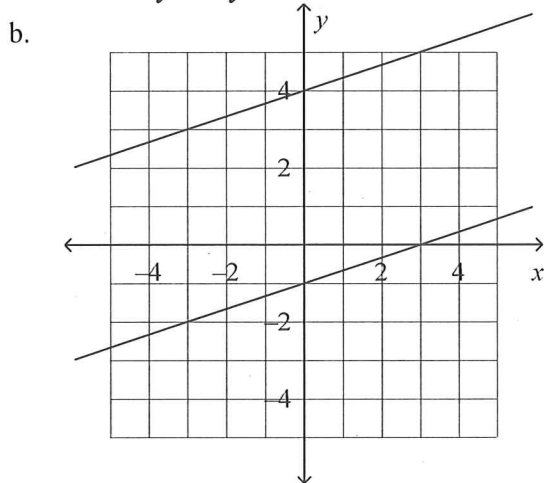


$(-4, 1)$

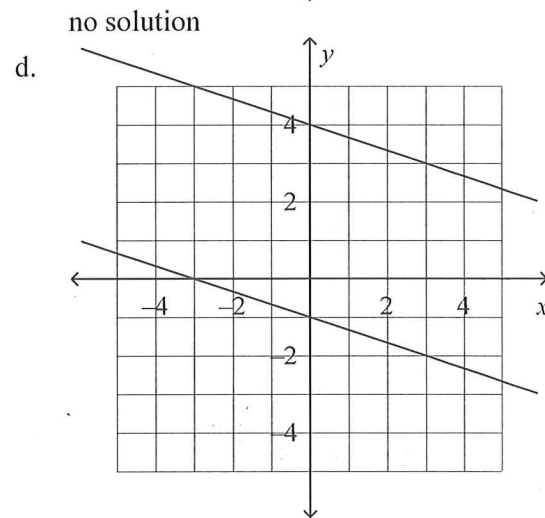
54.  $-\frac{1}{3}x + y = -1$  Which shows the graph + solution for the system of equations?  
 $y = 4 + \frac{1}{3}x$



infinitely many solutions



no solution



infinitely many solutions

Solve the system using elimination. (linear combination)

55.  $3x + y = 11$   
 $4x - y = 17$
- a.  $(-1, 4)$       b.  $(4, -1)$       c.  $(5, -4)$       d.  $(1, 4)$

Solve the system of equations using substitution.

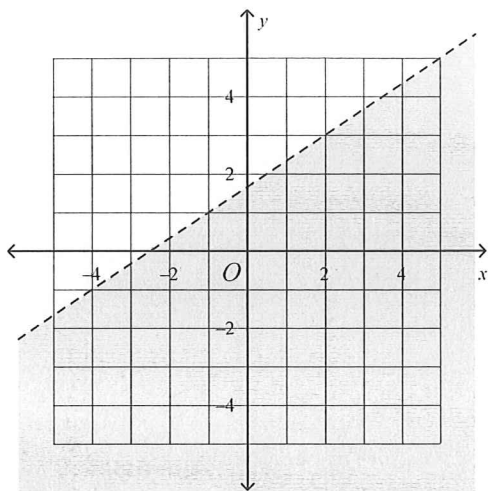
56.  $y = 2x - 10$   
 $y = 4x - 8$
- a.  $(3, 4)$       b.  $(-1, -12)$       c.  $(-4, -17)$       d.  $(3, -4)$

(gl)

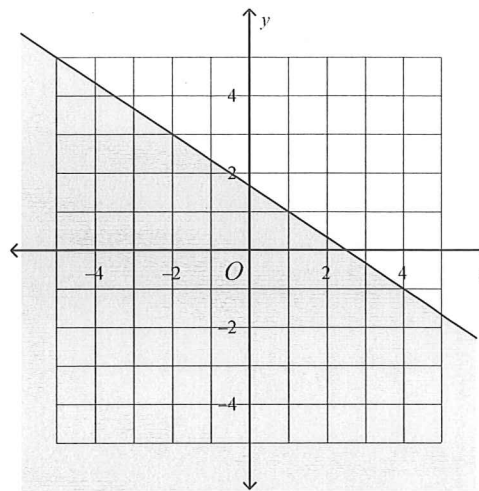
Graph the inequality.

57.  $4x + 6y \geq 10$

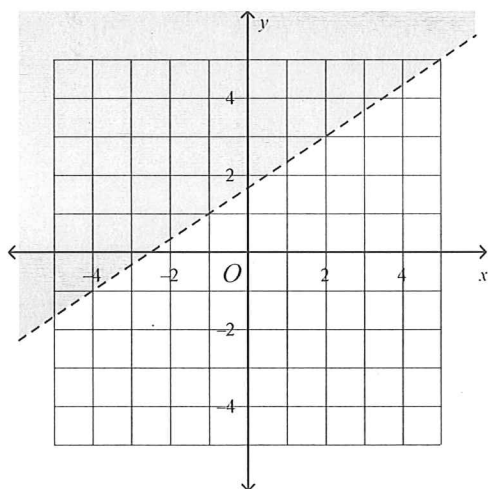
a.



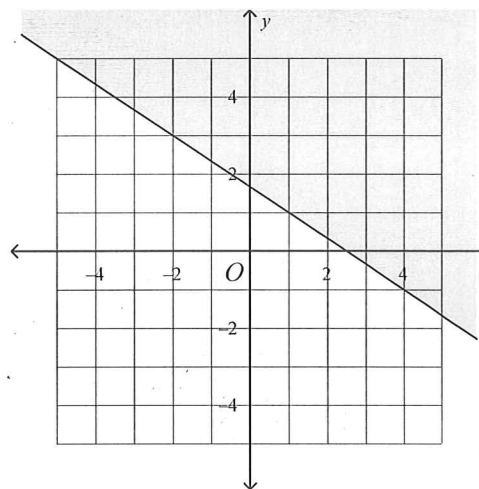
c.



b.



d.



58. Write the following inequality in slope-intercept form.

$5x - 5y \geq 70$

a.  $y \geq x - 14$

b.  $y \leq x + 14$

c.  $y \leq x - 14$

d.  $y \geq x + 14$

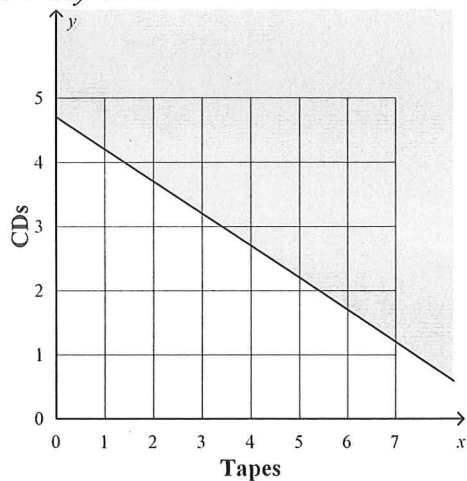
Name: \_\_\_\_\_

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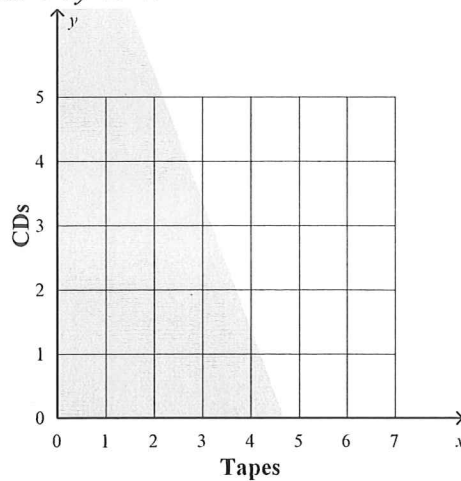
82

59. You have \$47 to spend at the music store. Each cassette tape costs \$5 and each CD costs \$10. Write and graph a linear inequality that represents this situation. Let  $x$  represent the number of tapes and  $y$  the number of CDs.

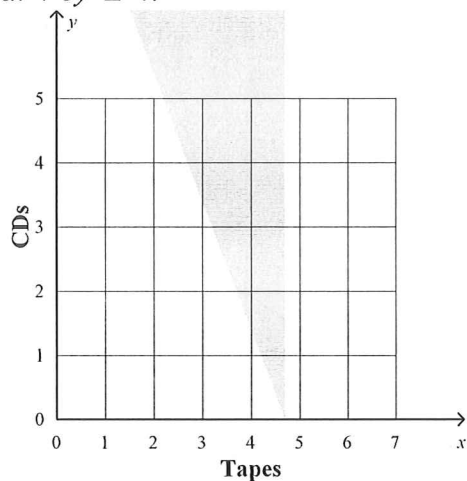
a.  $5x + 10y \geq 47$



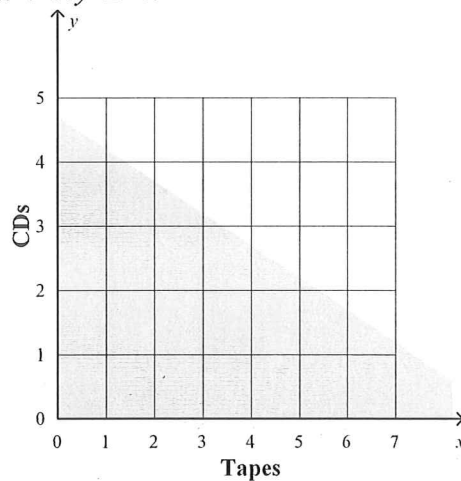
c.  $10x + 5y \leq 47$



b.  $10x + 5y \geq 47$

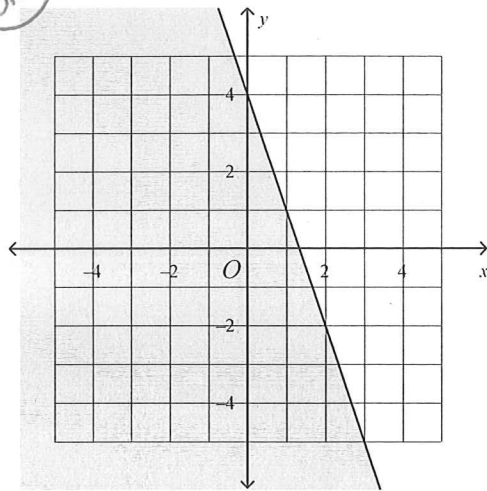


d.  $5x + 10y \leq 47$



Write the linear inequality shown in the graph.

60. 82



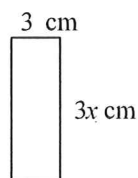
- a.  $y \geq -3x + 4$       b.  $y \leq -3x + 4$       c.  $y \geq -3x - 4$       d.  $y \leq -3x - 4$

Write and solve an equation.

61. Mark wants to buy a skateboard that costs \$65. He plans to save \$5 per week. How many weeks  $w$  will it take him to save \$65?

- a.  $5w = 65$ ; 13 weeks      c.  $w - 65 = 5$ ; 70 weeks  
b.  $\frac{w}{5} = 65$ ; 13 weeks      d.  $5 + w = 65$ ; 60 weeks

62. The perimeter of the rectangle is 24 cm. Find the value of  $x$ .



- a. 3      b. 12      c.  $\frac{8}{3}$       d. 18

63. The cost of a school banquet is \$90 for the room rental and \$14 per person attending. Write an expression to model the total cost of the banquet for  $p$  people. What is the cost for 70 people?

- a.  $14p + 90$ ; \$1,330      c.  $90p + 14$ ; \$1,070  
b.  $90 + 14p$ ; \$1,070      d.  $14 + 90p$ ; \$1,330

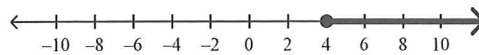
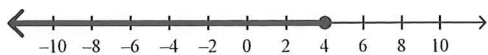
- \_\_\_\_\_ 64. A road has a speed limit of 30 mi/h. Write an inequality that describes the legal speeds  $r$  for motor vehicles.
- a.  $r > 30$                       b.  $r \leq 30$                       c.  $r \geq 30$                       d.  $r < 30$

**Solve the inequality. Graph the solutions.**

- \_\_\_\_\_ 65.  $a + 4 \geq 8$

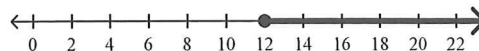
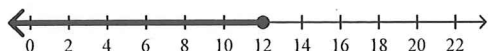
a.  $a \leq 4$

c.  $a \geq 4$



b.  $a \leq 12$

d.  $a \geq 12$



- \_\_\_\_\_ 66. What is the solution of the following system of equations?

$y = -4x + 7$

$y = -x + 4$

a.  $(4, 0)$

b.  $(1, 3)$

c.  $(-3, 19)$

d.  $(0, 7)$

- \_\_\_\_\_ 67. Suppose that  $y$  varies inversely with  $x$ . Write an equation for the inverse variation.

$y = 6$  when  $x = 8$

a.  $y = \frac{x}{48}$

b.  $y = 2x$

c.  $x = \frac{y}{2}$

d.  $y = \frac{48}{x}$