

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

## Final Review A: CMP 0809

### 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.**

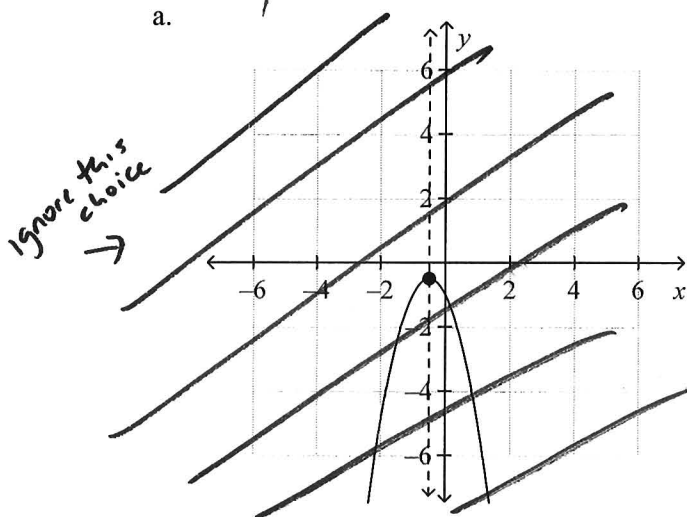
- \_\_\_\_\_ 3.  $(x - 4)(x + 3)$   
a.  $x^2 - 7x - 12$                       c.  $x^2 - x - 12$   
b.  $x^2 + x - 12$                       d.  $x^2 - 12x - 1$
- \_\_\_\_\_ 4. The base of a triangle is  $(6h + 16)$  centimeters. The height of the triangle is  $(3h - 8)$  centimeters. Find the area 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.**

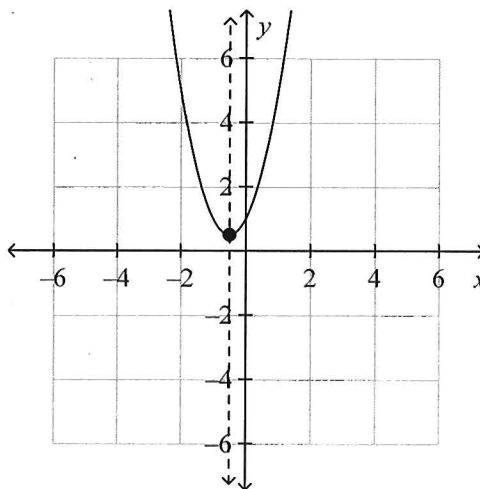
- \_\_\_\_\_ 5.  $k^2 - 16h^2$   
a.  $(k + 4h)(k + 4h)$                       c.  $h^2(k + 4)(k - 4)$   
b.  $(k - 4h^2)(k + 4)$                       d.  $(k + 4h)(k - 4h)$
- \_\_\_\_\_ 6.  $a^2 + ab - 56b^2$   
a.  $(a + 8b)(a + 7b)$                       c.  $(a + 8b)(a - 7b)$   
b.  $(a - 8)(a +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

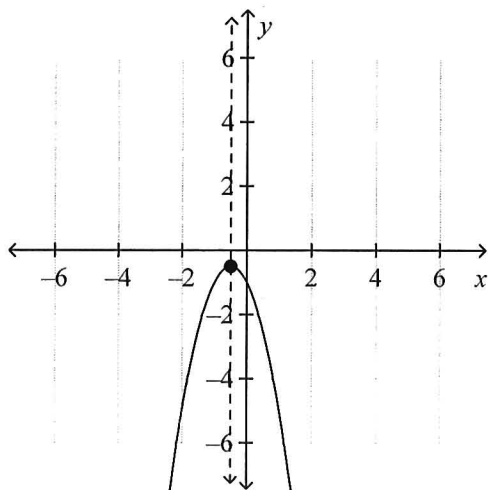
a.

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

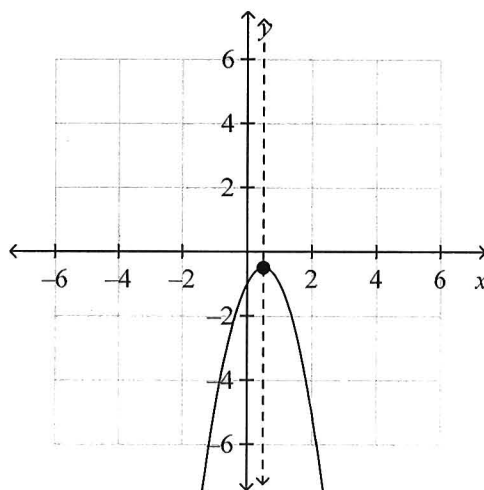
c.

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

b.

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

d.

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

89.

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.  
 a. Write an equation to model the population growth.  
 b. Predict the population after 12 years.
- a.  $y = 4 \cdot 2,700^x$ ; about 129,600 people  
 b.  $y = 2,700 \cdot 4^x$ ; about 4,323 people  
 c.  $y = 2,700 \cdot 1.04^x$ ; about 4,323 people  
 d.  $y = 2,700 \cdot 4^x$ ; 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.  
 a. \$535.29                      b. \$2,120.00                      c. \$520.00                      d. \$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?  
 a. \$9,152.6                      b. \$15,450                      c. \$8,237.34                      d. \$24,962.91

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

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



**Simplify the expression.**

- \_\_\_\_\_ 18.  $14^{-4}$   
 a.  $\frac{1}{14^4}$                       b. -56                      c.  $\frac{1}{14}$                       d.  $\frac{1}{14^{-4}}$

**Write the number in standard form.**

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

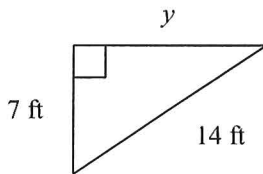
20. A scientist uses a spherical particle in an experiment. The diameter of Particle A is  $3.09 \times 10^{-5}$  centimeters.
- Write the diameter of Particle A in standard form.
  - What is the radius of Particle A? Express your answer in standard form.
- 0.0000309; 0.00001545 cm
  - 0.000309; 0.0000618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

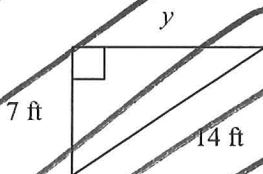
23.



Not drawn to scale

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

24.



Not drawn to scale

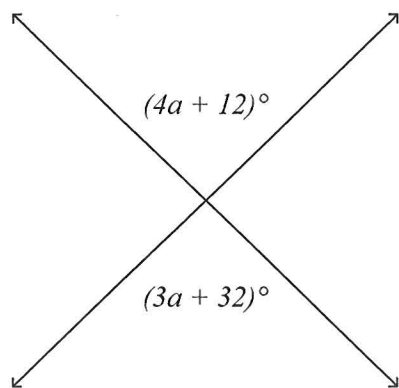
- 5.9 ft
  - 12.1 ft
25. Ingrid is making a quilt using squares that measure 5 in. on a side. What is the length of a diagonal of one of the quilt squares? Round to the nearest tenth.
- 8.7 in.
  - 7.1 in.
  - 3.5 in.
  - 14.2 in.

**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

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\_\_\_\_\_ 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.  $8w^8(3w^4 + 8)$

b.  $w^8(24w^4 + 64)$

c.  $8(3w^{12} + 8w^8)$

d.  $8w^7(3w^5 + 8w)$

**Solve the equation by factoring.**

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

a.  $z = 3$  or  $z = 9$

b.  $z = 3$  or  $z = -9$

c.  $z = -3$  or  $z = 9$

d.  $z = -3$  or  $z = -9$

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

a.  $z = 1$  or  $z = -2$

b.  $z = 1$  or  $z = 2$

c.  $z = 3$  or  $z = -2$

d.  $z = 3$  or  $z = 2$

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

a.  $c = 0$  or  $c = -4$

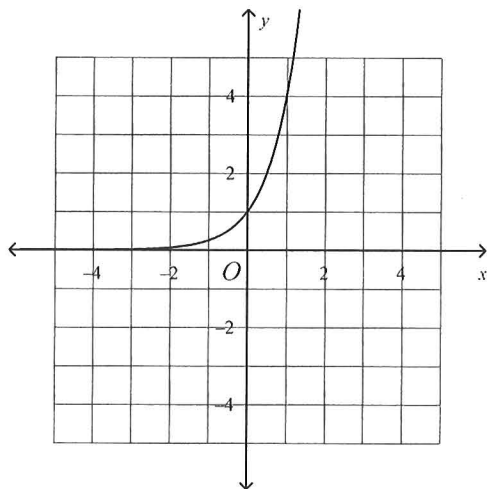
b.  $c = 0$  or  $c = \sqrt{4}$

c.  $c = 0$  or  $c = 4$

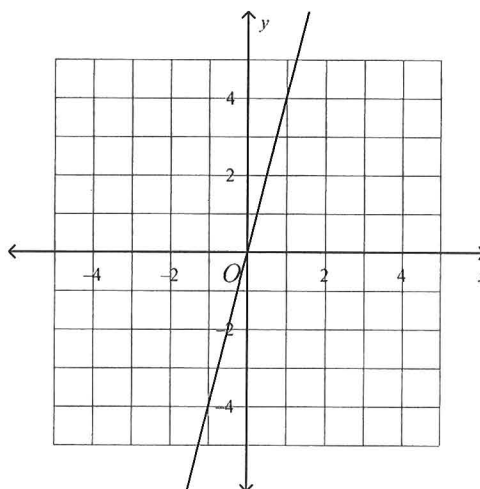
d.  $c = 1$  or  $c = -\sqrt{4}$

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

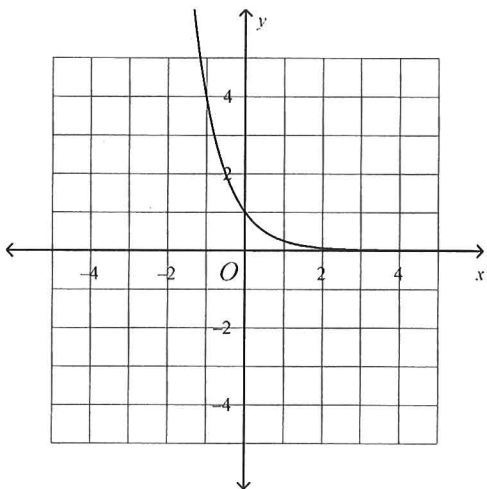
a.



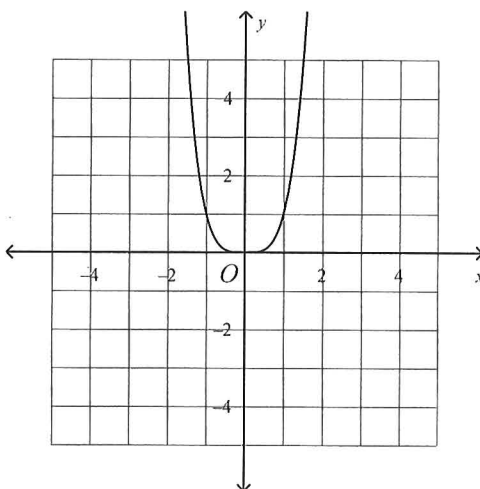
c.



b.



d.



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

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

a.  $y = 4x + 1$

b.  $y = x - 4$

c.  $y = -1x + 4$

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

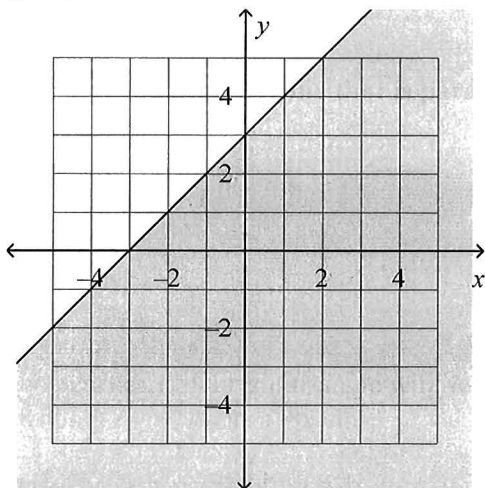
c. 70 cm

d. 47 cm

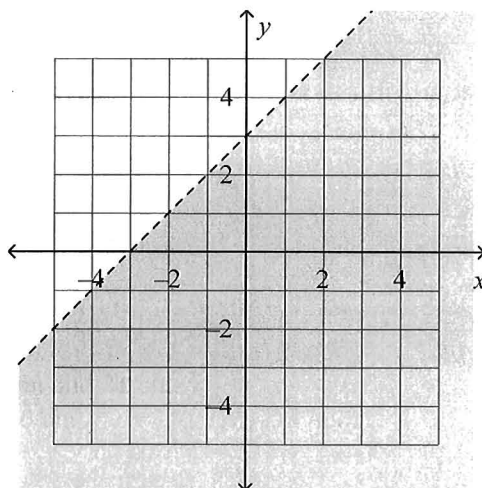
**Graph the inequality on a coordinate plane.**

45.  $y < x + 3$

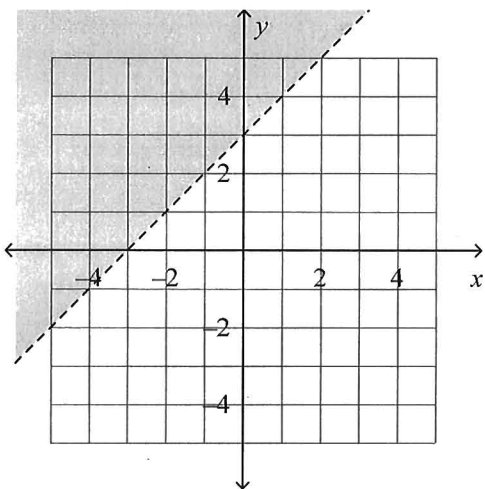
a.



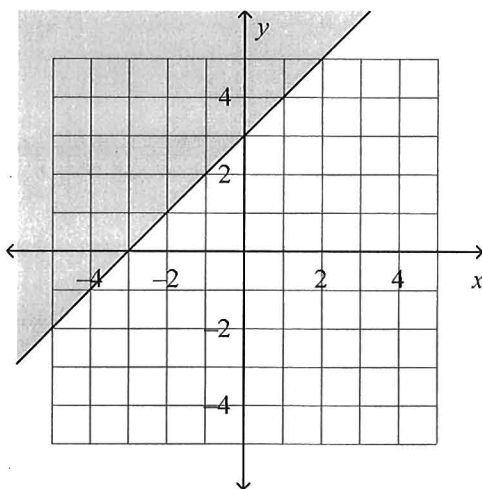
c.



b.

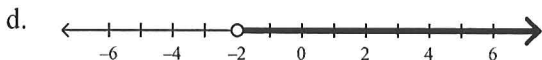
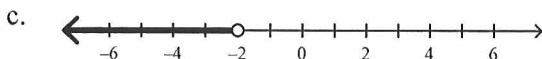
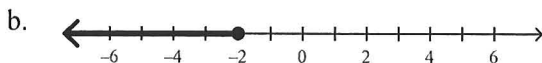
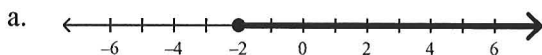


d.





\_\_\_\_\_ 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.

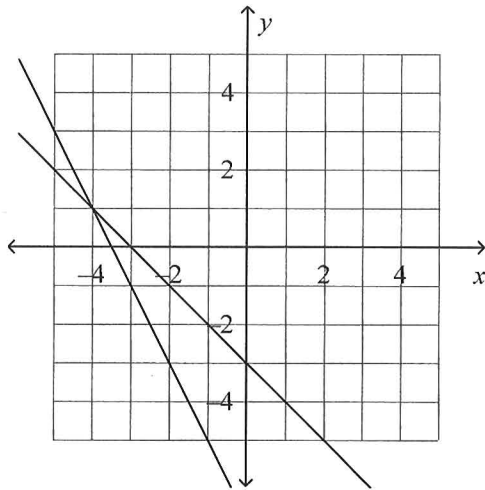
b.  $x$ -intercept is  $-3$ ;  $y$ -intercept is 9.

d.  $x$ -intercept is 9;  $y$ -intercept is  $-3$ .

Solve the system of equations by graphing.

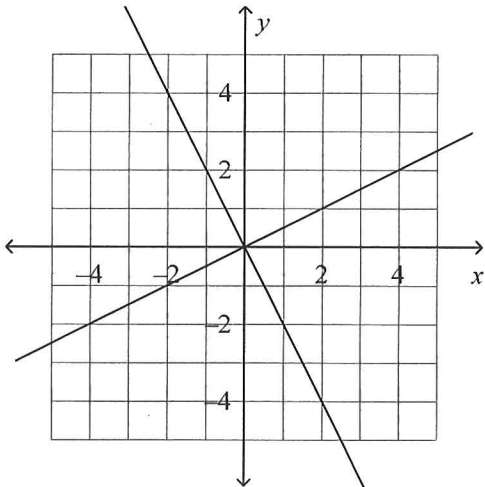
\_\_\_\_\_ 53.  $y = \frac{1}{2}x + 3$   
 $y = -2x - 7$

a.



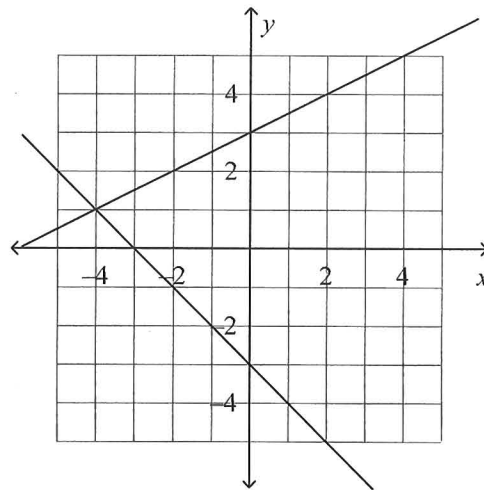
$(-4, 1)$

b.



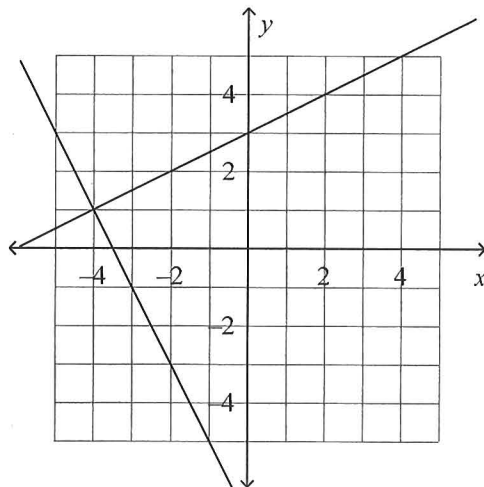
$(0, 0)$

c.



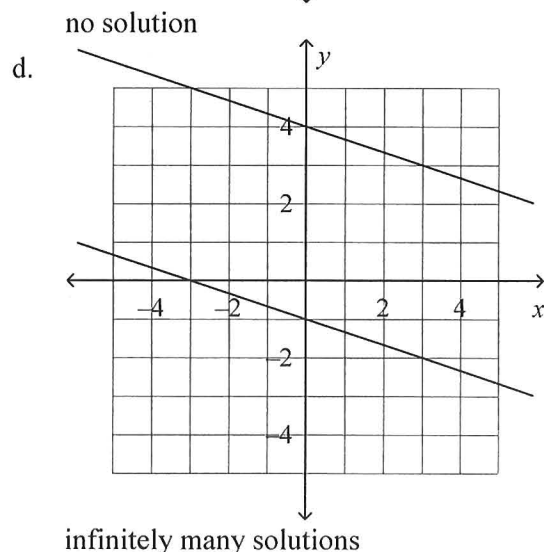
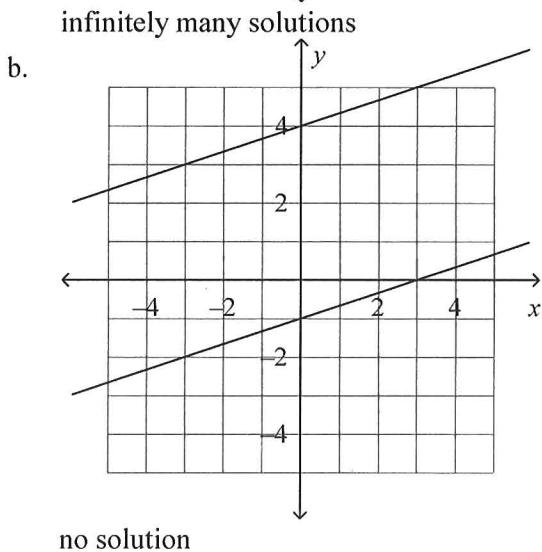
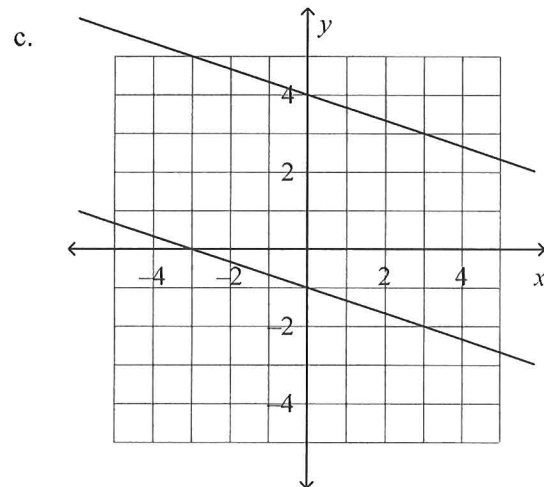
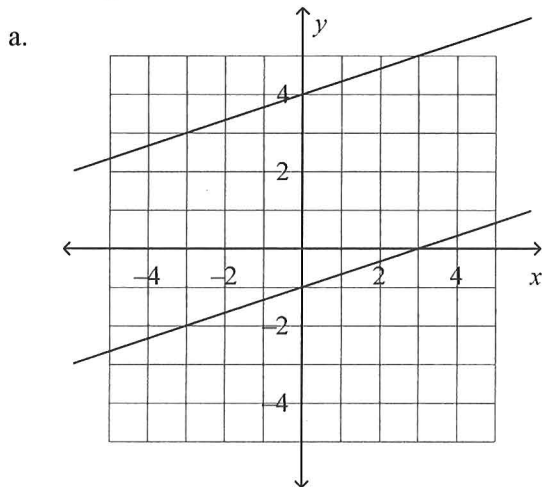
$(-4, 1)$

d.



$(-4, 1)$

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



Solve the system using elimination. (linear combination)

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

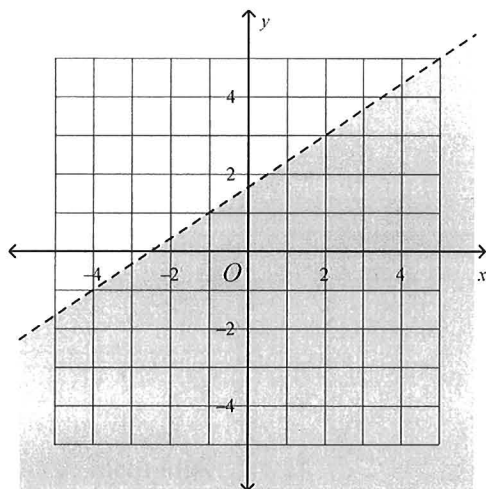
Solve the system of equations using substitution.

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

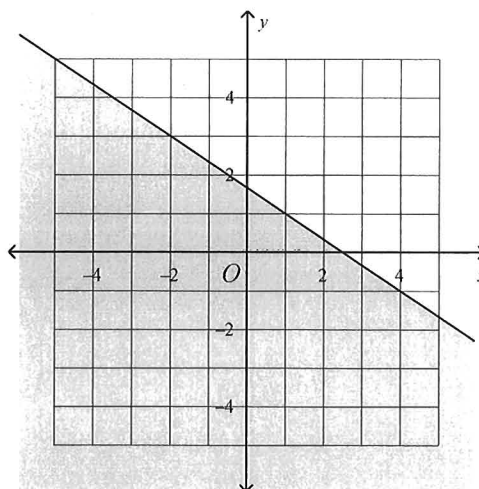
**Graph the inequality.**

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

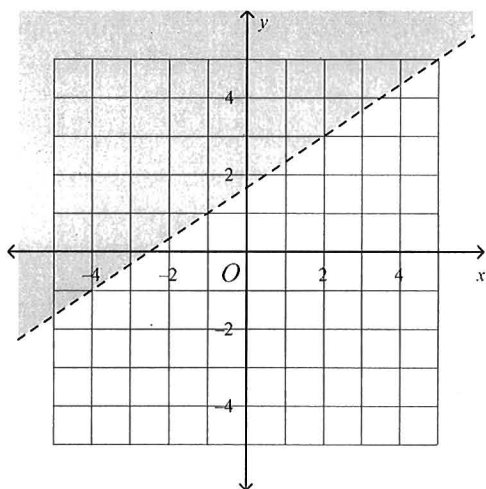
a.



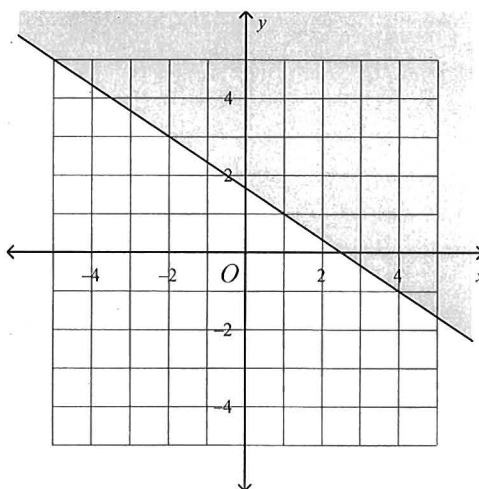
c.



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.  $y \geq x + 14$

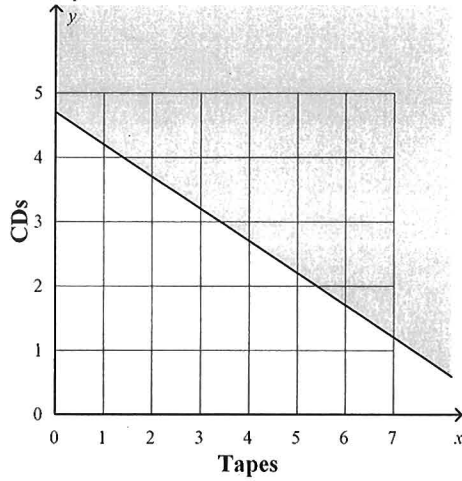
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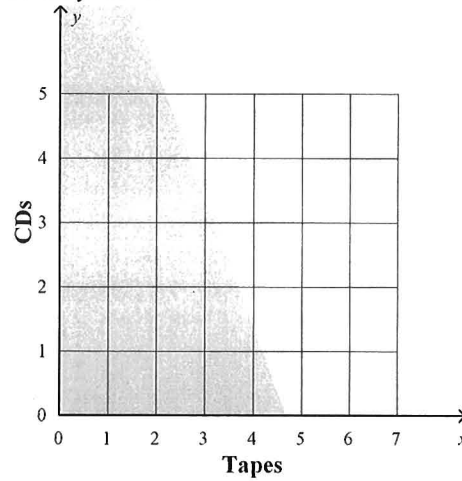
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59. You have \$47 to spend at the music store. Each cassette tape costs \$5 and each CD costs \$10. Write and graph a linear inequality that represents this situation. Let  $x$  represent the number of tapes and  $y$  the number of CDs.

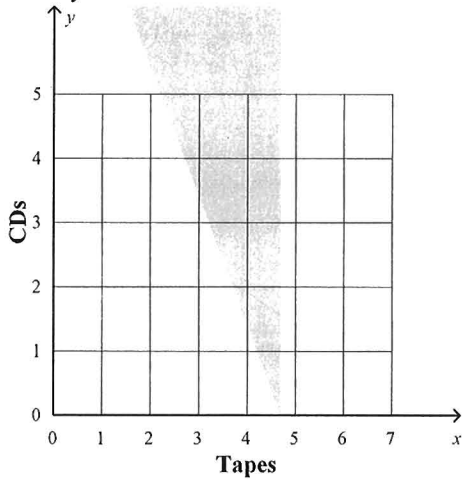
a.  $5x + 10y \geq 47$



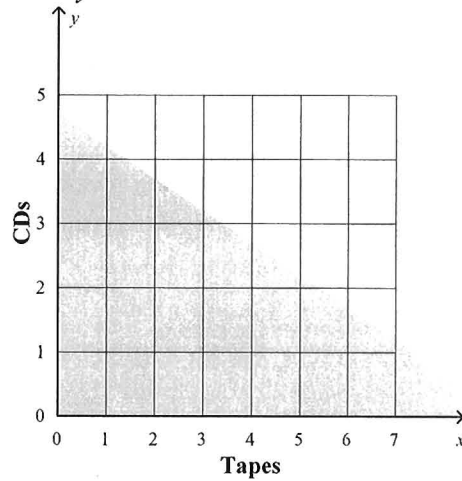
c.  $10x + 5y \leq 47$



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

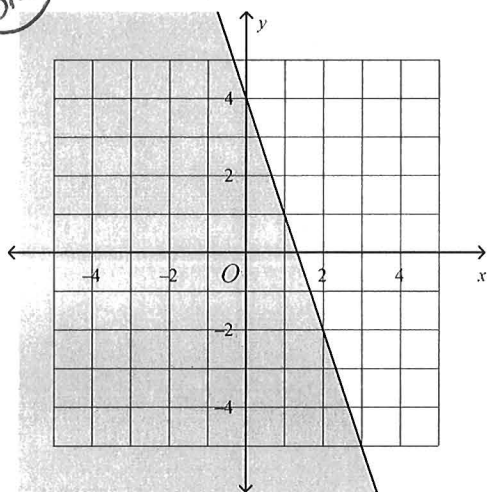


d.  $5x + 10y \leq 47$



Write the linear inequality shown in the graph.

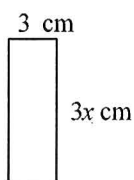
60. 82



- 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  $x$ .



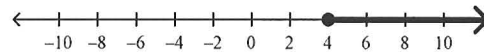
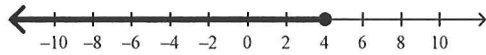
- a. 3    b. 12    c.  $\frac{8}{3}$     d. 18
63. The cost of a school banquet is \$90 for the room rental and \$14 per person attending. Write an expression to model the total cost of the banquet for  $p$  people. What is the cost for 70 people?
- a.  $14p + 90$ ; \$1,330    c.  $90p + 14$ ; \$1,070
- 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.**

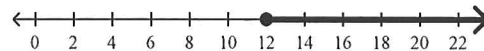
- \_\_\_\_\_ 65.  $a + 4 \geq 8$
- a.  $a \leq 4$

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