Algebra EOC Practice Test #4

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

____ 1. For $f(x) = 3x + 4$, find $f(2)$ and find x such that $f(x) = 17$.

    a.   9; 7   c. $12; \dfrac{10}{3}$

    b. $10; \dfrac{13}{3}$ d.   24; 7

____ 2. 40 candidates apply for a unique job. The job has both a height requirement and a weight requirement. The following information is known about the candidates:

21 candidates meet the height requirement;
17 candidates meet the weight requirement;
8 candidates meet both the weight and height requirements.

How many candidates meet only the weight requirement?

    a.   8   c.   13
    b.   9   d.   17

____ 3. Simplify:

$$(3x^2 - 2x + 1) - (x^2 - 2x - 3) + (4x^2 - x + 2)$$

    a. $6x^2 - x + 6$ c. $6x^2 - x$
    b. $6x^2 - 5x + 6$ d. $8x^2 - 5x + 6$

____ 4. Given the equation:

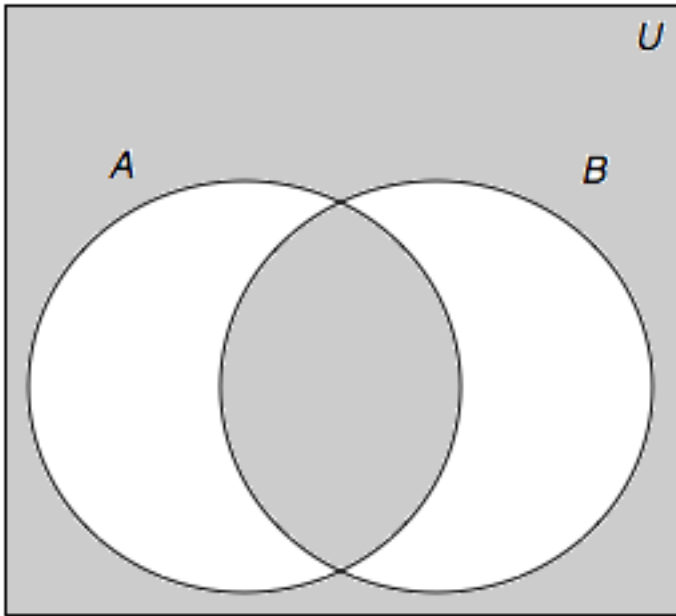$$y = -3$$

What is the slope? What is the y-intercept?

    a.   slope = –3; y-intercept = –3
    b.   slope is undefined; y-intercept = –3
    c.   slope = 0; y-intercept = 0
   d.   slope = 0; y-intercept = –3

____ 5. In the Venn diagram, the universe U represents people that live in a certain neighborhood. Set A represents people with pools, and set B represents people with gardens.

What is the BEST description of the people reprented by the shaded areas of the Venn diagram?

a. These are people that either have a pool or a garden, but not both.

b. These are people that have neither a pool nor a garden.

c. These are people that have both a pool and a garden.

d. These are people that have both a pool and a garden, or neither of these things.

____ 6. Find the union and intersection of the pair of sets.
$M = \{2, 6, 12\}; N = \{3, 6, 12, 13, 14\}$

a. $M \cup N = \{2, 3, 6, 12\}$;
$M \cap N = \{6, 12\}$

b. $M \cup N = \{2, 3, 6, 12, 13, 14\}$;
$M \cap N = \{6, 12\}$

c. $M \cup N = \{2, 3, 6, 12, 13, 14\}$;
$M \cap N = \{6\}$

d. $M \cup N = \{6, 12\}$;
$M \cap N = \{2, 3, 6, 12, 13, 14\}$

_____ 7. Abbey goes bike riding. The graph represents the distance she rides over time. Which of the following is the best interpretation of the slope of the line segment?
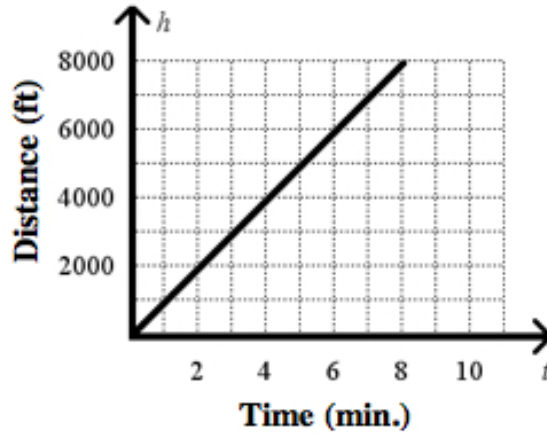
a. She bike rides 1,000 feet per minute.

c. It takes her 1 minute to ride 2,000 feet.

b. It takes her 2 minutes to ride 1,000 feet.

d. She bike rides 8,000 feet per minute.

_____ 8. Students in grades 6, 7, and 8 sold a total of 320 concert tickets. Grade 6 students sold x tickets. Grade 7 students sold s tickets and Grade 8 students sold t tickets.

Use the equation $x + s + t = 320$ to find x, the number of tickets that were sold by Grade 6 students.

a. $x = 320 - t + s$

c. $x = 320 + t - s$

b. $x = 320 - t - s$

d. $x = s - t - 320$

_____ 9. Find the value of b.

$$9x^2 + bx - 21 = 3(3x^2 + 2x - 7)$$

a. -3

c. 3

b. 2

d. 6

____ 10. Samantha is going shopping for shirts and shorts. Shirts cost $10 and shorts cost $15. Samantha will spend $90. The equation below can be used to find out how many shirts and shorts Samantha can buy, where x is the number of shirts and y is the number of shorts.
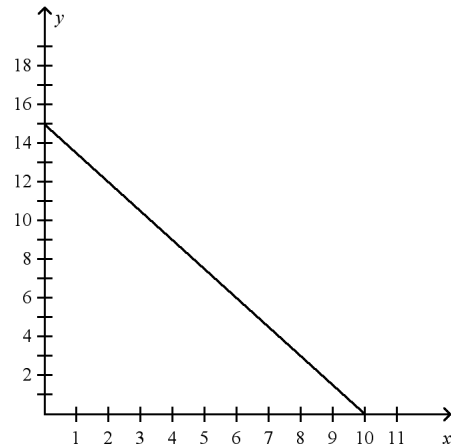
$$10x + 15y = 90$$

Which of the following graphs shows the graph of this equation?

a.
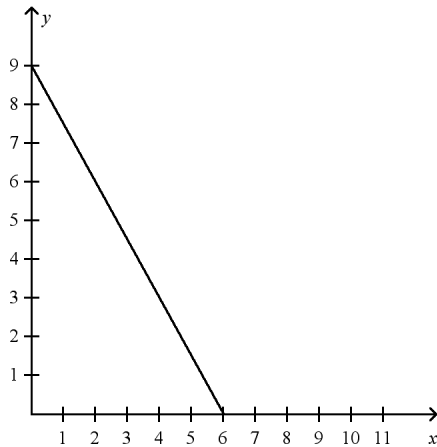
c.

b.
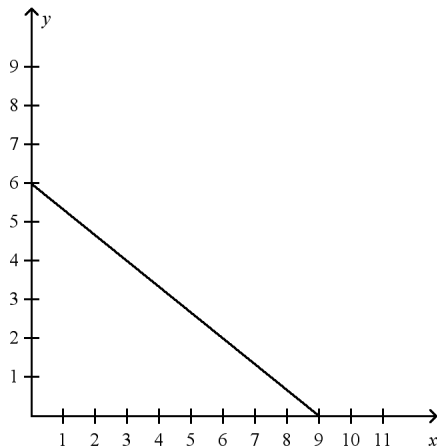
d.
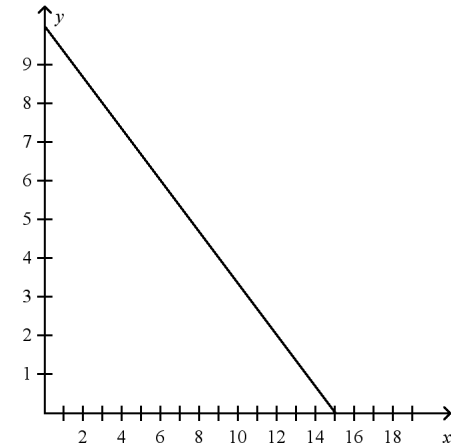
____ 11. Which equation represents the data in the table?

x	0	1	2	3	4
y	-4	-2	0	2	4

a. $y = x - 4$ c. $y = 2x - 4$

b. $y = 2x - 2$ d. $y = 4x - 4$

_____ 12. Which of the following properties could be used to solve the following equation?
$$-9p = -108$$
    a. Addition Property of Equality   c. Multiplication Property of Equality
    b. Subtraction Property of Equality   d. Distributive Property

_____ 13. If you graph $y = 2x^2 - 8x - 10,$ the y-intercept of the graph of the equation is _____.

    a. -18 c. 2
    b. -10 d. 5

_____ 14. Which of the following epressions is equal to 1? Assume variables represent postive numbers.

    a. $3x^0$ c. x^1
    b. $10(x^0)$ d. $(5x)^0$

____ 15. In Mr. Rojo's music class, 14 students play piano, 18 students play guitar, and 9 play drums. No student plays any other istruments. The following information is also true:

7 students play only guitar;
2 students play all three instruments;
5 students play only piano;
1 student plays piano and drums, but not guitar

This information is placed in a Venn diagram as shown:
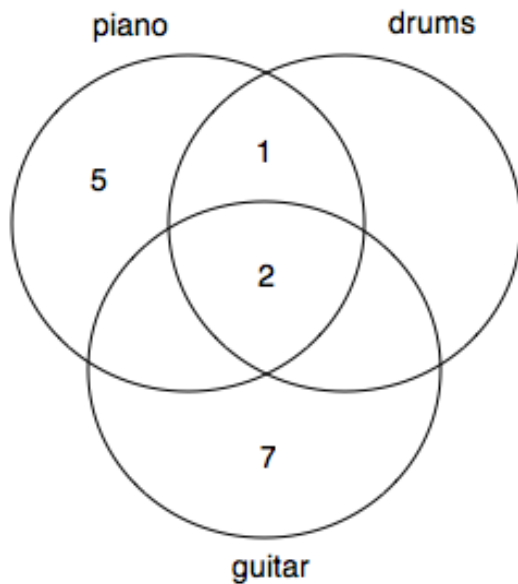
How many students play exactly two instruments?

a.	10	c.	15
b.	12	d.	18

____ 16. A cannonball is fired with an initial velocity of 100 meters per second. The object's distance, d, above the ground at any time, t, can be represented by the equation $d = 100t - 5t^2$. When will the cannonball be 600 meters above the ground?

a.	$t = 10$ sec	c.	$t = 8.6$ sec, $t = 11.4$ sec
b.	$t = 5$ sec, $t = 15$ sec	d.	The cannonball will never reach 600 meters.

____ 17. The values in the table show a linear relationship. Find the slope.

x	6	8	11	15
y	4	10	19	31

a. 3

b. −3

c. $\dfrac{1}{3}$

d. $-\dfrac{1}{3}$

____ 18. Papaya are on sale at 2 fruit for $5.00. How much will 5 papaya cost?
   a. $10.00
   b. $15.50
   c. $12.50
   d. $25.00

____ 19. Factor: $2(3 - m) - 3m(m - 3)$

a. $(2 - 3m)(m - 3)$
b. $(2 + 3m)(m - 3)$
c. $(2 + 3m)(3 - m)$
d. $(6 - 2m)(m - 3)$

____ 20. A driver who completes 4 laps has driven 10 miles. Determine how many laps a driver must complete to have driven 35 miles.
   a. 40 laps
   b. 12 laps
   c. 14 laps
   d. 9 laps

____ 21. Christina is using her computer to design invitations to her birthday party. The text of the invitation is contained in a rectangle with a length of 9.5 inches and a width of 5 inches. Around the perimeter of the text, Christina wants to have a red border of width r. Around the red border, she wants a purple border of width p. Find an expression for the perimeter of the completed invitation.
   a. $29 + 8r + 8p$
   b. $19 + 8r + 8p$
   c. $14.5 + 4r + 4p$
   d. $47.5 + 6r + 2p$

____ 22. A jar of dimes and quarters is worth $4.55. If there are the same number of dimes as quarters, what is the value of only the dimes?

a. $1.10
b. $1.30
c. $2.40
d. $3.25

____ 23. Add $\sqrt{27} + \sqrt{48} + \sqrt{75}$.

    a.   cannot combine   c. $12\sqrt{3}$

    b. $5\sqrt{6}$ d. $50\sqrt{3}$

____ 24. Leslie joins a fitness club that has a membership fee of $20 plus $15 per month. Rashad's club has a fee of $40 and charges $10 per month. In how many months will the two clubs cost the same?

    a.   4 months   c.   9 months

    b.   6 months   d.   12 months

____ 25. Factor $5(x - 2) - 9x(x - 2)$.

    a. $-45x(x - 2)$ c. $(5 - 9x)(x - 2)(x - 2)$

    b. $(x - 2)(9x - 5)$ d. $(x - 2)(5 - 9x)$

____ 26. What is the equation of the line that is perpendicular to $\overline{PQ}$ and passes through the origin?

    a. $y = -1$

    b. $x = 0$

    c. $y = 0$

    d. $y = x$

____ 27. To be safe for eating when cooking beef, the internal temperature should be between 145°F and 170°F, inclusive. Which graph shows the safe cooking temperatures for beef?

    a.   c.

    b.   d.

____ 28. Divide. Simplify your answer.

$$(12x^4 - 18x^3 + 36x^2) \div (6x^3)$$

a. $12x - 18 + \dfrac{36}{x}$

c. $2x^4 - 3x^3 + 6x^2$

b. $2x - 3 + \dfrac{6}{x}$

d. $6x - \dfrac{12}{x^2} + \dfrac{30}{x^3}$

____ 29. You've saved $120 and plan to spend $16 for each music CD you purchase. Write an equation to represent *d*, the amount of dollars remaining, as a function of *c*, the number of CDs you purchase.

a. $c = 16d$

c. $c = 16d - 120$

b. $d = 16c$

d. $d = 120 - 16c$

____ 30. A decorator charges $40 for an initial consultation, then $80 per hour. Another decorator just charges $90 per hour. How long is a job for which the two decorators charge the same price?

a. 1 hour

c. 4 hours

b. 2 hours

d. 8 hours

____ 31. Charlie has $75 saved and wants to buy DVDs, which cost $9.00 per DVD. The linear equation $y = -9x + 75$ represents this situation where *y* is the number of dollars remaining from his savings and *x* is the number of DVDs that have been purchased.

What is the *x*-intercept? What does the *x*-intercept represent?

a. *x*-intercept = 75; The x-intercept represents the amount of money Charlie has saved.

c. *x*-intercept = $\dfrac{25}{3}$; The x-intercept represents the number of DVDs that Charlie can buy. In this case this means he can buy 8 DVDs.

b. *x*-intercept = 8; The x-intercept represents the number of DVDs that Charlie can buy. In this case this means he can buy 8 DVDs.

d. *x*-intercept = 3; The x-intercept represents the amount of money Charlie has left after he has purchased 8 DVDs.

____ 32. Give the domain and range of the relation.

x	y
3	7
10	21
0	0
−2	−3

    a.   D: {−3, 0, 7, 21}; R: {−2, 0, 3, 10}   c.   D: {−2, 0, 3, 10}; R: {−3, 0, 7, 21}
    b.   D: {−2, 3, 10}; R: {−3, 7, 21}   d.   D: {3, 10, −2, 7, 21, −3}; R: {0}

____ 33. Brenda is building a rectangular pen for her dog. She has enough fencing to build the pen so that its perimeter is 34 feet and its area is 60 feet. What are the dimensions of the dog pen?
    a.   3 feet by 20 feet   c.   5 feet by 12 feet
    b.   4 feet by 15 feet   d.   6 feet by 10 feet

____ 34. Jake fills a tank that can hold 200 gallons of water. The tank already has 50 gallons of water in it when Jake starts filling it at the rate of 10 gallons per minute. Karla fills a tank that can hold 300 gallons of water. That tank already has 100 gallons of water in it when Karla starts filling it at the rate of 5 gallons per minute. Jake and Karla start filling the tanks at the same time. How long after they start filling the tanks do the tanks have the same volume of water? What is that volume of water?
    a.   5 minutes; 150 gallons   c.   10 minutes; 150 gallons
    b.   5 minutes; 250 gallons   d.   10 minutes; 250 gallons

____ 35. Divide $(8y^4 - 8y^2 + 2)$ by $4y^3$.

    a. $\dfrac{2}{y} + \dfrac{1}{2y^3}$ c. $2y - \dfrac{2}{y} + \dfrac{1}{2y^3}$

    b. $\dfrac{2}{y} - 2y + 2y^3$ d. $2y - 8y^2 + 2$

____ 36. Write an equation for the line that contains the point (-1, 2) and is perpendicular to the line $y = 3$.

    a. $x + y = -1$ c. $y = 2$
    b. $x + y = 1$ d. $x = -1$

____ 37. Rebecca has t pounds of grapes. She serves p pounds of the grapes to her friends as a snack on Tuesday and q pounds for dessert on Wednesday. She now has 2.7 pounds left.

Use the equation $2.7 = t - p - q$ to find p, the number of pounds Rebecca served as a snack on Tuesday.
    a. $p = t + q - 2.7$ c. $p = t - q - 2.7$
    b. $p = t - q + 2.7$ d. $p = t + q + 2.7$

____ 38. A patio will be built in the shape of a trapezoid. The bases of the trapezoid will measure 14.5 ft and 22.5 ft. What is the minimum height of the trapezoid if the patio is to have an area of no less than 259 sq ft?

a. 3.5 ft   c. 14 ft

b. 7 ft   d. 18.5 ft

____ 39. What are the missing exponent and coefficient in the equation below? Give the missing exponent first.

$$2(3m^5)^? = ?m^{-10}$$

a. $-5; -30$ c. $-2; \dfrac{2}{9}$

b. $-2; -18$ d. $-2; -\dfrac{2}{9}$

____ 40. Multiply. Write the product in simplest form.

$$\sqrt{2}\left(\sqrt{2} + \sqrt{5}\right)$$

a. $2 + \sqrt{10}$ c. $\sqrt{14}$

b. $\sqrt{4} + \sqrt{10}$ d. $2\sqrt{2} + 2\sqrt{5}$

____ 41. Pierre needs to simplify the expression below before he substitutes values for x and y.

$$\frac{x^{16}y^9 + x^6 y^2}{x^2 y^2}$$

If $x \neq 0$ and $y \neq 0$, which of the following is a simplified version of the expression above?

a. $x^{14}y^7 + x^6 y^2$ c. $x^{18}y^8$

b. $x^{14}y^7 + x^4 y$ d. $x^{20}y^9$

____ 42. You are painting the walls in your bedroom and have determined that since you have to paint two coats, one gallon of paint will cover 200 square feet. Which input/output (I/O) model correctly displays the domain and range of this situation where f, the number of square feet that can be painted is a function of g, the number of gallons of paint purchased?

I/O Model 1

input	1	2	3	4	5
output	200	400	600	800	1000

I/O Model 2

input	200	400	600	800	1000
output	1	2	3	4	5

I/O Model 3

input	100	200	300	400	500
output	1	2	3	4	5

I/O Model 4

input	1	2	3	4	5
output	100	200	300	400	500

    a.   I/O Model 1
    b.   I/O Model 2
    c.   I/O Model 4
    d.   I/O Model 3

____ 43. A company distributes its product by train and by truck. The cost of distributing by train can be modeled as $-0.09x^2 + 34x - 100$, and the cost of distributing by trucks can be modeled as $-0.04x^2 + 22x - 175$, where x is the number of tons of product distributed. Write a polynomial that represents the difference between the cost of distributing by train and the cost of distributing by trucks.

    a. $-0.05x^2 + 56x - 275$ c. $-0.05x^2 + 12x + 75$
    b. $-0.13x^2 + 12x - 275$ d. $-0.05x^2 + 12x - 275$

____ 44. A cable company charges $35 to begin service and $20 per month. Which rule represents the total charge for x months of service?

    a. $y = 35x + 20$ c. $y = 20(35)x$
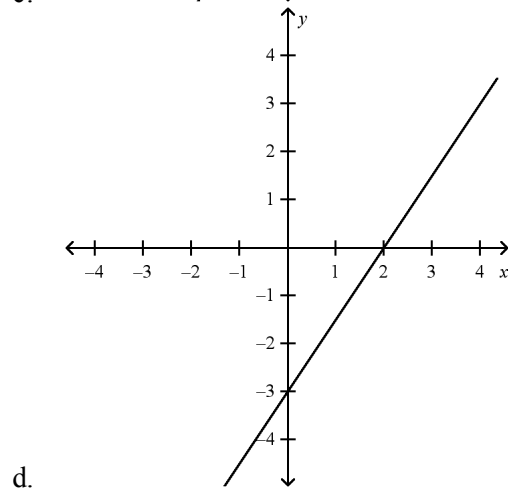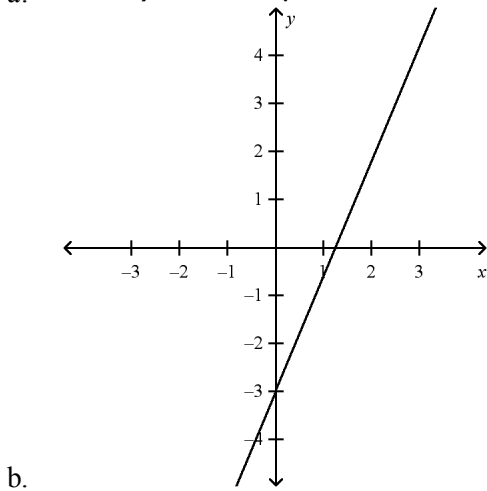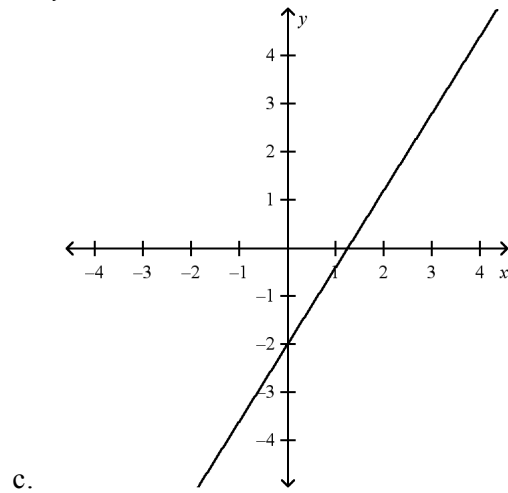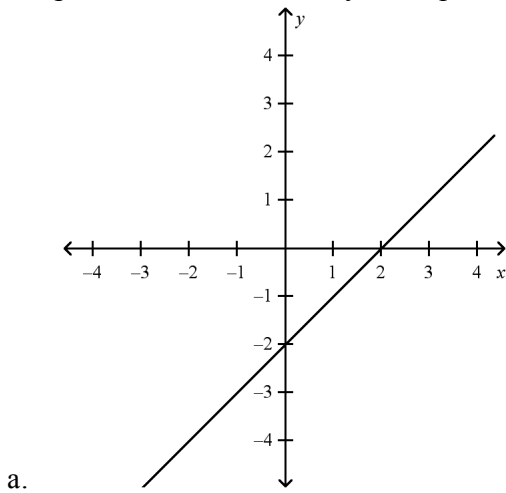   b. $y = 20x + 35$ d. $y = (35 + 20)x$

____ 45. *ABCD* is a parallelogram.
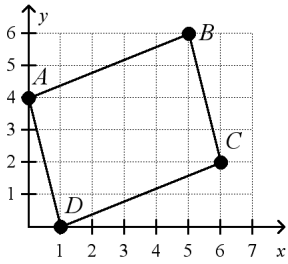

What is the equation of the line containing $\overline{CD}$?

a. $5x + 2y = 2$

b. $y = \dfrac{2}{5}x + 1$

c. $2x - 5y = 2$

d. $2x + 5y = 2$

____ 46. Graph the line described by the equation $4x - 4y = 8$.

a.

b.

c.

d.

____ 47. Miguel has \$85 saved and wants to buy DVDs, which cost \$8.50 per DVD. The linear equation $y = -8.50x + 85$ represents the number of dollars y remaining from his savings after x DVDs have been purchased. Graph the equation and explain the meaning of the slope as a rate of change.
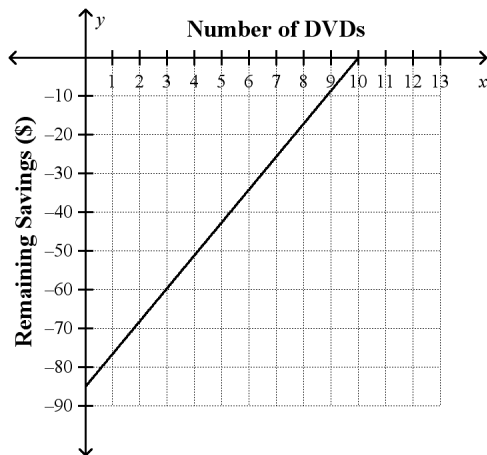
a.
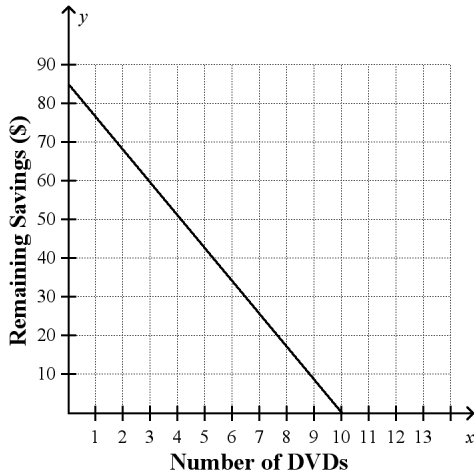
Number of DVDs

The slope means that Miguel spends \$8.50 from his savings for every DVD he buys. The slope is negative, because the amount in his savings is decreasing.
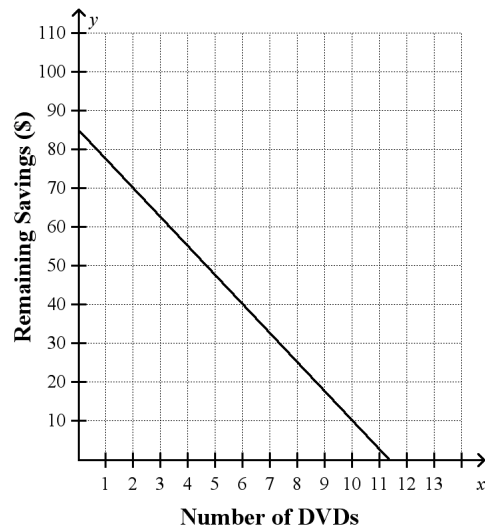
c.
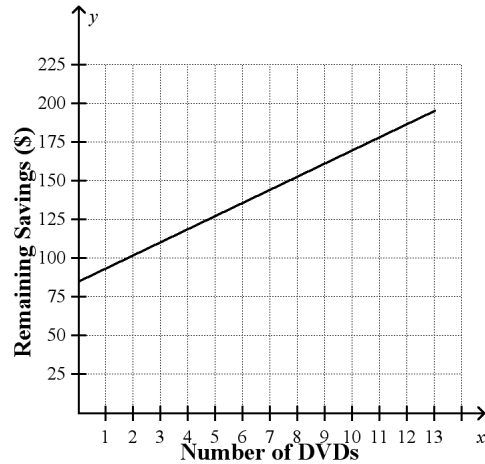
Number of DVDs

The slope means that Miguel spends \$8.50 from his savings for every DVD he buys. The slope is positive, because the amount Miguel is spending is increasing.

b.

The slope means that Miguel spends \$8.50 from his savings for every DVD he buys. The slope is positive, because the amount Miguel is spending is increasing.

d.

Number of DVDs

The slope means that Miguel spends \$7.50 from his savings for every DVD he buys. The slope is negative, because the amount Miguel is spending is increasing.

____ 48. Jennifer is a car saleswoman. She is paid a salary of $2000 per month plus $300 for each car that she sells. Her monthly salary can be modeled by the equation $f(x) = 300x + 2000$ where x is the number of cars sold. Which of the following is a graph that represents this situation?

a.
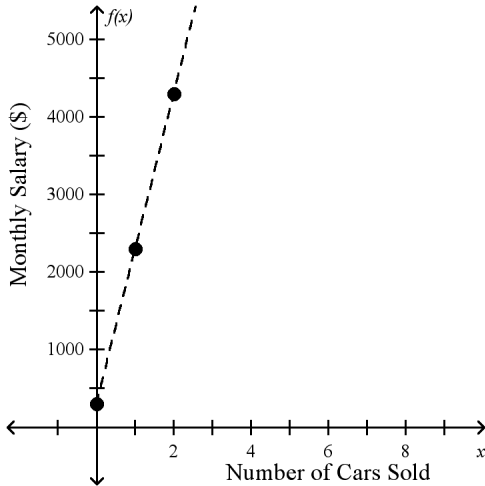
c.
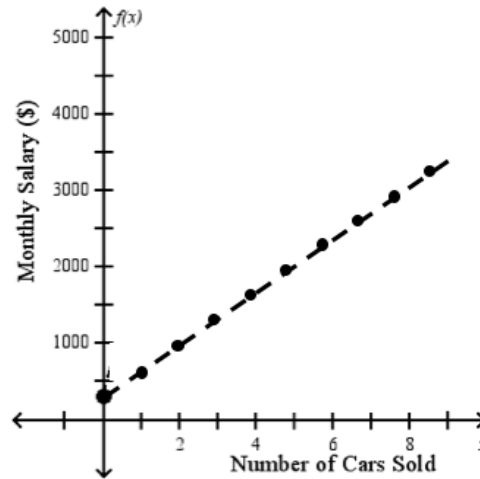
b.

d.

____ 49. Which inequality is shown by the graph below?

a. $-2 \le w \le 3$

b. $-2 < w \le 3$

c. $w \ge 3$ and $w < -2$

d. $-2 > w \ge 3$

____ 50. Solve $8.7 = 3.5y - 2.5(5.4 - 6y)$.

   a. -3 c.   1.2
   b.   -1.2   d.   2

____ 51. A baker has 16 cups of chocolate chips. His recipe for chocolate chip cookies calls for $1\dfrac{1}{2}$ cups of
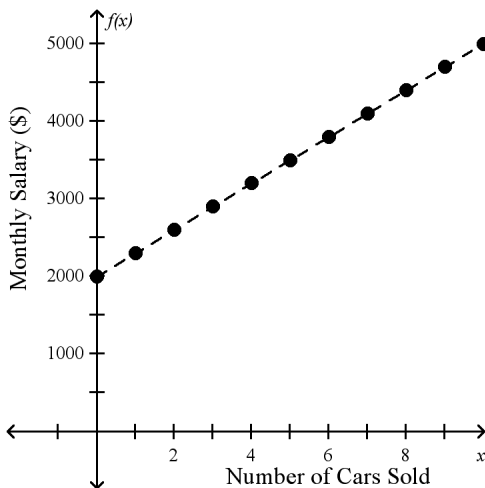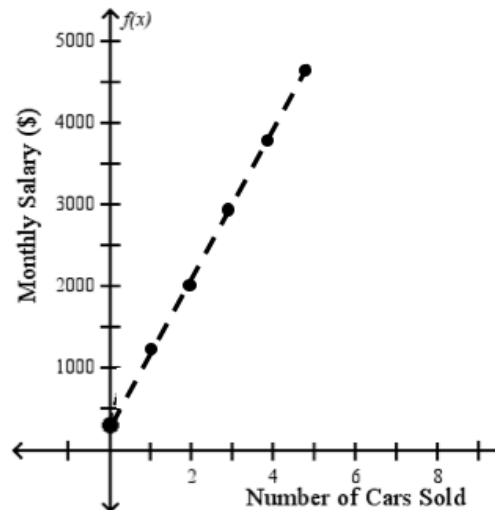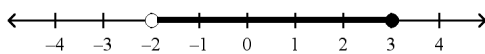
   chocolate chips per batch. Which inequality can be solved to find b, the number of batches of
   chocolate chip cookies the baker can make?

   a. $\dfrac{b}{16} < 1\dfrac{1}{2}$ c. $1\dfrac{1}{2}b > 16$

   b. $\dfrac{b}{16} \le 1\dfrac{1}{2}$ d. $1\dfrac{1}{2}b \le 16$

____ 52. The trajectory of a model rocket launched from a rocket launcher on the ground at an angle of 50
   degrees with an initial speed of 55 meters per second can be modeled by the parabola: $f(x) = 1.19x -$
   $0.0039x^2$, where the x-axis is the ground. Find the height of the highest point of the trajectory and the
   horizontal distance the model rocket travels before hitting the ground.

   a.   height: 95 m; distance: 301 m   c.   height: 88 m; distance: 300 m
   b.   height: 99 m; distance: 310 m   d.   height: 91 m; distance: 305 m

____ 53. Find the intersection of the pair of sets.
   $M = \{1, 2, 3, 4, 5, 6\}; N = \{2, 3, 4, 5, 6, 7\}$

   a.   c.
        $M \cap N = \{2, 3, 4, 5\}$ $M \cap N = \{1, 2, 3, 4, 5, 6, 7\}$
   b.   d.
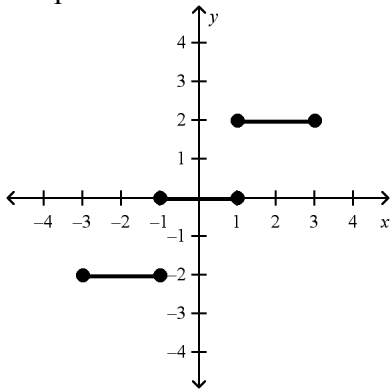 $M \cap N = \{2, 3, 4, 5, 6\}$ $M \cap N = M$

16

____ 54. A strip of uniform width is to be added to all four sides of a 9 ft. by 12 ft. rectangle to form a new rectangle of area 180 square feet. How wide is the strip?
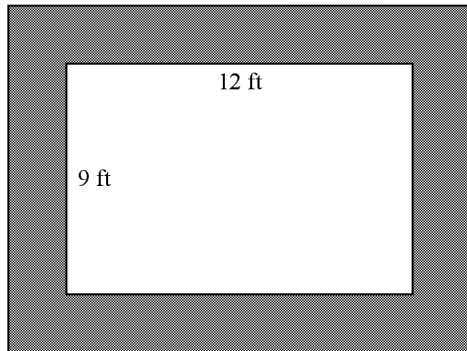
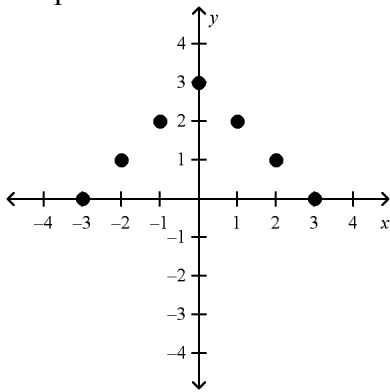|		
a. 1.5 feet		c. 3 feet
b. 2 feet		d. 6 feet

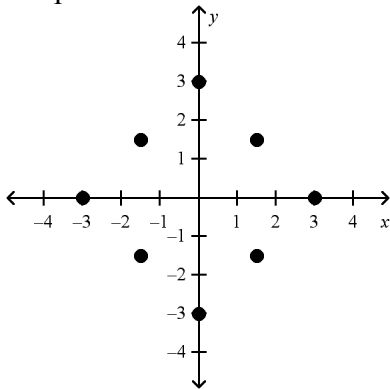____ 55. Determine which of the following graphs represent a function.

Graph A

Graph B

Graph C

a. None of the graphs are functions.
b. Graph B is a function.

c. Graphs A and B are functions.
d. Graphs B and C are functions.

Algebra EOC Practice Test #4
Answer Section

MULTIPLE CHOICE

   1. ANS: B   PTS: 1   STA: MA.912.A.2.3
   2. ANS: B   PTS: 1   STA: MA.912.D.7.2
   3. ANS: A   PTS: 1   STA: MA.912.A.4.2
   4. ANS: D   PTS: 1   STA: MA.912.A.3.9
   5. ANS: D   PTS: 1   STA: MA.912.D.7.2
   6. ANS: B   PTS: 1   STA: MA.912.D.7.1
   7. ANS: A   PTS: 1   STA: MA.912.A.3.11
   8. ANS: B   PTS: 1   STA: MA.912.A.3.3
   9. ANS: D   PTS: 1   STA: MA.912.A.4.2
 10. ANS: B   PTS: 1   STA: MA.912.A.3.8
 11. ANS: C   PTS: 1   STA: MA.912.A.3.11
 12. ANS: C   PTS: 1   STA: MA.912.A.3.2
 13. ANS: B   PTS: 1   STA: MA.912.A.7.1
 14. ANS: D   PTS: 1   STA: MA.912.A.4.1
 15. ANS: A   PTS: 1   STA: MA.912.D.7.2
 16. ANS: D   PTS: 1   STA: MA.912.A.7.8
 17. ANS: A   PTS: 1   STA: MA.912.A.3.9
 18. ANS: C   PTS: 1   STA: MA.912.A.5.4
 19. ANS: C   PTS: 1   STA: MA.912.A.4.3
 20. ANS: C   PTS: 1   STA: MA.912.A.5.4
 21. ANS: A   PTS: 1   STA: MA.912.A.4.3
 22. ANS: B   PTS: 1   STA: MA.912.A.3.15
 23. ANS: C   PTS: 1   STA: MA.912.A.6.2
 24. ANS: A   PTS: 1   STA: MA.912.A.3.15
 25. ANS: D   PTS: 1   STA: MA.912.A.4.3
 26. ANS: B   PTS: 1   STA: MA.912.A.3.10
 27. ANS: B   PTS: 1   STA: MA.912.A.3.4
 28. ANS: B   PTS: 1   STA: MA.912.A.4.4
 29. ANS: D   PTS: 1   STA: MA.912.A.2.3
 30. ANS: C   PTS: 1   STA: MA.912.A.3.5
 31. ANS: C   PTS: 1   STA: MA.912.A.3.9
 32. ANS: C   PTS: 1   STA: MA.912.A.2.4
 33. ANS: C   PTS: 1   STA: MA.912.A.7.8
 34. ANS: C   PTS: 1   STA: MA.912.A.3.15
 35. ANS: C   PTS: 1   STA: MA.912.A.4.4
 36. ANS: D   PTS: 1   STA: MA.912.A.3.10
 37. ANS: C   PTS: 1   STA: MA.912.A.3.3
 38. ANS: C   PTS: 1   STA: MA.912.A.3.5
 39. ANS: C   PTS: 1   STA: MA.912.A.4.1

40. ANS: A

    Distribute $\sqrt{2}$. Use the Product Property of Square Roots to multiply the factors in each term. If the radicand in either term contains any perfect square factors, factor the radicand(s) and simplify. Combine like terms if applicable.

    PTS: 1   STA: MA.912.A.6.2
41. ANS: B   PTS: 1   STA: MA.912.A.4.4
42. ANS: A   PTS: 1   STA: MA.912.A.2.4
43. ANS: C   PTS: 1   STA: MA.912.A.4.2
44. ANS: B   PTS: 1   STA: MA.912.A.3.5
45. ANS: C   PTS: 1   STA: MA.912.A.3.10
46. ANS: A   PTS: 1   STA: MA.912.A.3.8
47. ANS: A   PTS: 1   STA: MA.912.A.3.11
48. ANS: B   PTS: 1   STA: MA.912.A.3.8
49. ANS: B   PTS: 1   STA: MA.912.A.3.4
50. ANS: C   PTS: 1   STA: MA.912.A.3.2
51. ANS: D   PTS: 1   STA: MA.912.A.3.4
52. ANS: D   PTS: 1   STA: MA.912.A.7.8
53. ANS: B   PTS: 1   STA: MA.912.D.7.1
54. ANS: A   PTS: 1   STA: MA.912.A.7.8
55. ANS: B   PTS: 1   STA: MA.912.A.2.3