NAME CLASS DATE

Course 3 Unit 2 Practice

LESSON 9-1

Use the figures below to answer Items 1–5.

Figure 1

Figure 2

Figure 3

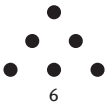
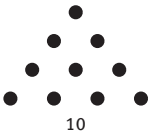


Figure 4



1. **Model with mathematics.** Draw the fifth and sixth figures.

2. Organize the number of dots in each figure into a table.

3. How many dots would be in the 12th figure?

   A. 156

   B. 78

   C. 56

   D. 26

4. **Attend to precision.** Write an expression that could be used to determine the number of dots in figure n.

5. How many dots would be in the 75th figure?

   A. 5700

   B. 2850

   C. 1275

   D. 75

LESSON 9-2

Use the figures below to answer Items 6–10. Assume each figure is a regular decagon with sides measuring one unit.

Figure 1

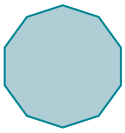


Figure 2

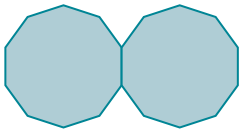
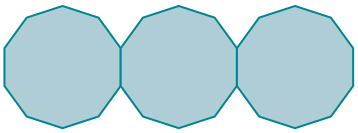


Figure 3



6. Assume the length of each side is one unit. What is the perimeter of each figure?

7. **Model with mathematics.** Draw the next two figures.

8. Use appropriate tools strategically. What would be the perimeter of the 10th figure? Explain your reasoning.

9. Which expression could be used to determine the perimeter of the nth figure?

A. $10 + 9n$

B. $10 + 9n - 1$

C. $10 + 8n - 1$

D. $10 + 8(n - 1)$

10. What is the perimeter of the 50th figure?

A. 402

B. 409

C. 459

D. 460

LESSON 10-1

11. Solve for the variable in the equation: $-2x + 15 = 37$.

12. Solve $\frac{3}{4}x = 15$ for x.

A. $11\frac{1}{4}$

B. 12

C. 20

D. 30

13. Solve for w in the equation $0.4w + 2.45 = 8.75$.

14. Make sense of problems. Describe each step in solving the equation $5y + 9 = 34$.

$5y + 9 = 34$	**Original equation**
$5y + 9 - 9 = 34 - 9$	**a.**
$5y = 25$	
$\frac{5y}{5} = \frac{25}{5}$	**b.**
$y = 5$	

15. Reason quantitatively. Solve the equation $a + 2b = c$ for b.

A. $b = c + \frac{a}{2}$

B. $b = c - 2a$

C. $b = \frac{c+a}{2}$

D. $b = \frac{c-a}{2}$

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LESSON 10-2

16. Solve the inequality $8x - 5x + 3 < x - 7 + 10$ for x.

A. $x < 0$

B. $x > 3$

C. $x < 4$

D. $x > 6$

17. Solve the equation $4x + 5 \geq 3(x + 2)$.

18. Model with mathematics. The sum of three numbers is 164. The second number is 3 more than twice the first number, and the third number is four times the first number. What are the three numbers?

19. Solve the equation $5(x - 2) = 7(x + 4)$ for x.

A. $x = -21$

B. $x = -19$

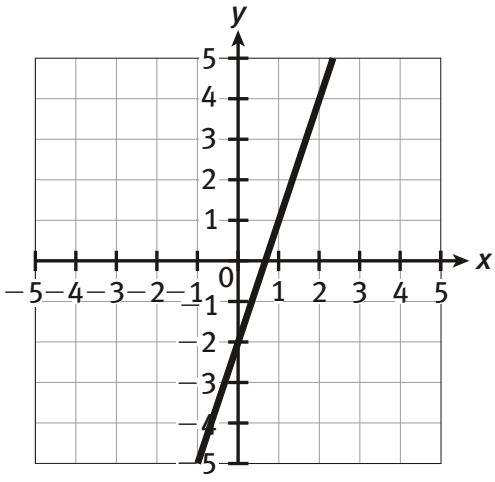
C. $x = 2$

D. $x = 4$

20. Reason abstractly. The perimeter of a triangle is 165 feet. The sides of the triangle have length x, $5x$ and $6x - 3$. What is the length of each side of the triangle?

LESSON 11-1

21. Find the slope and y-intercept of the line graphed below.



22. Attend to precision. Determine the slope and y-intercept of the line represented in the table below. Explain your thinking.

x	y
−1	5
0	3
1	1
3	−3

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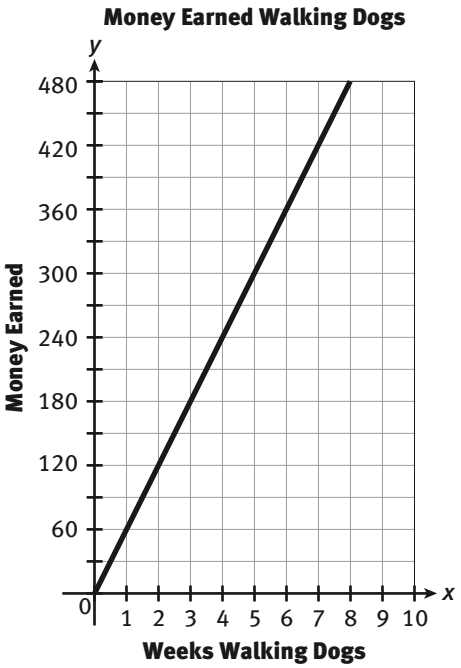
23. The graph below shows the amount of money a student earns for walking dogs. Use the graph to answer parts a–d.



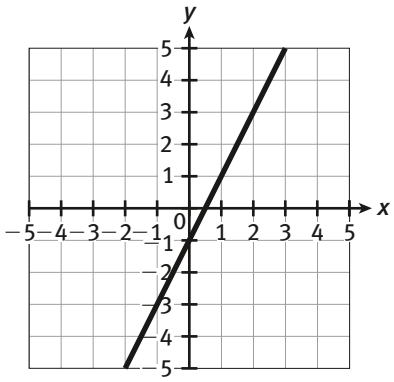
a. What is the slope of the line?

b. What is the y-intercept of the line?

c. Make use of structure. Write an equation that can be used to determine how much money, D, the student has earned after w weeks.

d. Attend to precision. Calculate how much money the student will have earned after 26 weeks.

24. What is the slope of the line?



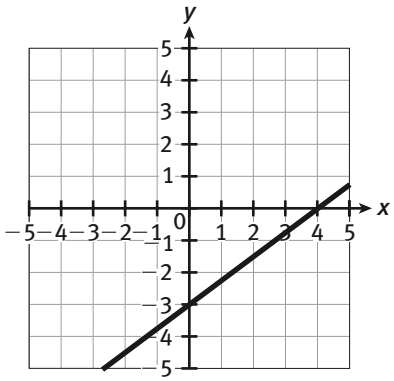
A. -2

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 2

25. What is the y-intercept of the line?



A. -4

B. -3

C. 3

D. 4

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LESSON 11-2

26. A line with a slope of $-\frac{3}{4}$ contains the point $(8, -4)$. What other point is on the line?

A. $(4, 0)$

B. $(3, 4)$

C. $(2, 8)$

D. $(0, 2)$

27. Terrence rides his bike 36 miles in 3 hours.

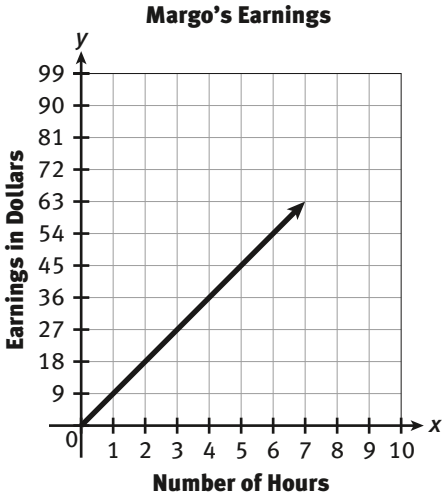
a. Create a ratio of Terrence's miles per hour.

b. Use the ratio you created to determine how far Terrence can ride in 7 hours.

c. If Terrence rode his bike for 54 miles at the rate you determined, how long did he ride?

d. Make sense of problems. Natalie rides her bike 21 miles in 2 hours. If Natalie started at the same time as Terrence and also rode her bike at a constant rate for 54 miles, who finished first? Explain your reasoning.

28. Cassie and Margo work in the souvenir shop at the Mud Hens ballpark. Cassie earns \$12 plus \$8 for each hour she works. Margo's earnings are modeled by the graph shown below.



a. Model with mathematics. Write equations to represent each girl's earnings.

b. State and interpret the slope and y-intercept of each girls' equation you wrote in part a.

c. If both girls work 7 hours, who earns more?

29. Which equation can be used to model the data shown in the table?

Hour	Water remaining (gallons)
0	500
1	475
2	450
3	425
4	400
5	375
6	350

A. $y = 500 + 25x$ **B.** $y = 500 - 25x$

C. $y = 350 - 25x$ **D.** $y = 350 + 50x$

30. The local bike shop has a bike rental special. The cost to rent a bicycle is \$4 plus \$2 per hour. Use the information to complete Items a–d.

a. Complete the table below to determine the total cost to rent a bicycle for the different number of hours.

Number of Hours	0	1	2	3	4	5
Total Cost						

b. Reason quantitatively. Explain how you know the data in the table are linear.

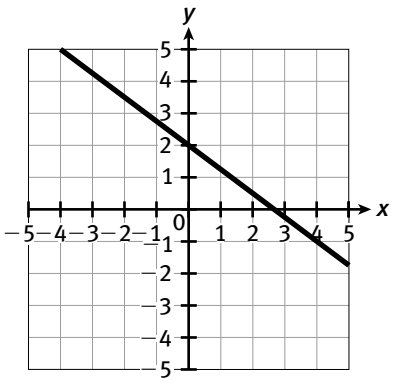
c. Determine the slope and y-intercept of the line represented in the table.

d. Write an equation that could be used to determine the total cost to rent a bicycle for h hours in a day.

LESSON 12-1

31. The data in the table are graphed below. What is the slope of the line?

x	y
−4	5
0	2
1	1.25
4	−1



A. $-\frac{3}{4}$ **B.** $-\frac{1}{2}$

C. $\frac{2}{3}$ **D.** $\frac{4}{3}$

32. Model with mathematics. Write an equation for the data shown in the table. State the slope and y-intercept of the line.

x	−3	−2	−1	0	1	2	3
y	12	8	4	0	−4	−8	−12

33. Canoe Central charges \$10 to rent one of its canoes plus \$4 per hour.

a. Write an equation that gives the total cost, y, for the number of hours, x, that a canoe is rented.

b. State the slope and y-intercept that your equation represents.

34. Nicholas is driving a distance of 200 miles. He drives at a constant rate of 65 mile per hour.

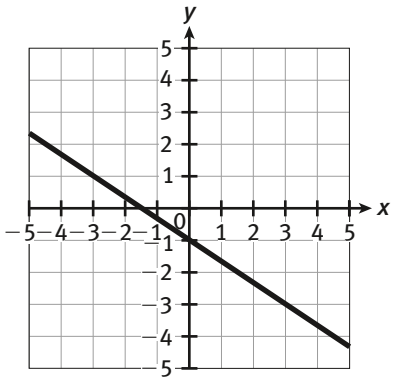
A. $y = 200 + 65x$

B. $y = 200 - 55x$

C. $y = 200 - 65x$

D. $y = 65 - 200x$

35. Make use of structure. What is the slope of the line shown below?



A. $-\frac{3}{4}$ **B.** $-\frac{2}{3}$

C. 1 **D.** 3

LESSON 12-2

36. Which linear representation has the greatest rate of change?

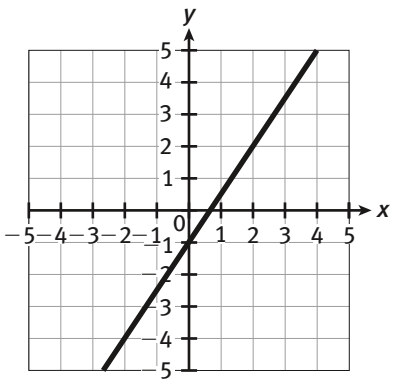
A. $y = x - 2$

B.

x	0	1	2	3	4
y	0	4	8	12	16

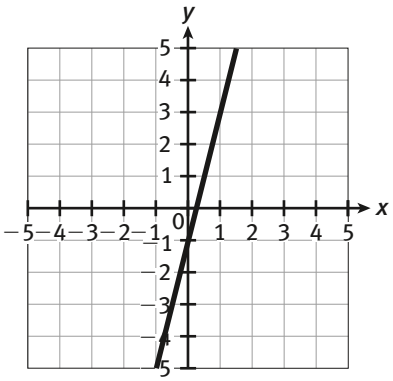
C. $y = 2x + 1$

D.

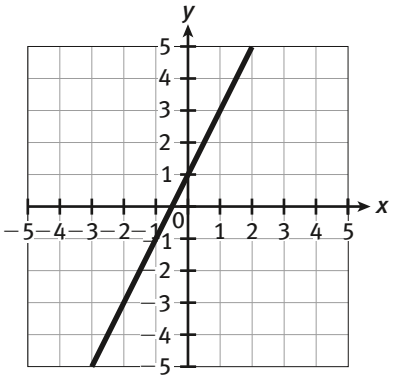


37. Critique the reasoning of others. Jamal and Rachel disagree about the following two graphs. Jamal feels that the line in Graph A is steeper, while Rachel feels that the line in Graph B is steeper. Which line is steeper? Justify your reasoning.

Graph A



Graph B



38. Which line has the steepest slope?

A. $y = \frac{2}{3}x - 1$

B. $y = \frac{1}{2}x + 2$

C. $y = \frac{3}{4}x + 4$

D. $y = \frac{1}{4}x - 5$

39. Construct viable arguments. The table and equation represent different linear relationships. Which one has the greater rate of change? Explain your reasoning.

$y = 4x - 1$

x	-3	-2	-1	0	1
y	-7	-5	-3	-1	1

40. Kenya is graphing the three equations shown below.

$y = \frac{2}{3}x$

$y = x + 3$

$y = 3x - 1$

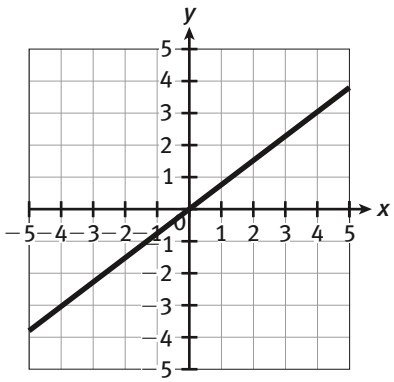
a. What is the slope of each line?

b. Which line is the steepest?

LESSON 12-3

41. What are the slope and coordinates of the y-intercept of the equation $y = -5x + 3$?

42. Make sense of problems. What is the equation of the graphed line?



A. $y = \frac{1}{2}x$

B. $y = \frac{3}{4}x$

C. $y = \frac{5}{6}x$

D. $y = \frac{2}{5}x$

43. Model with mathematics. Graph each line using the slope and y-intercept.

a. $y = 3x - 1$

b. $y = -2x + 3$

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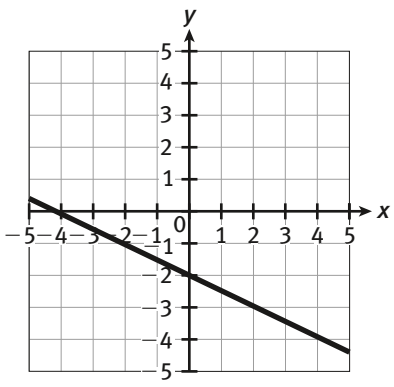
44. What is the equation for the line graphed below?



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

B. $y = -4x - 2$

C. $y = -2x - 4$

D. $y = 4x + 2$

45. Badri is reading a book which is 280 pages long. Badri reads 40 pages, on average, each day. To model the number of pages he has left to read in the book over time:

a. Create a table of values.

b. Construct a graph.

c. Write an equation.

d. State the meaning of the slope and y-intercept you wrote in part c.

LESSON 13-1

46. Jermaine wants to sign up for archery classes. The local archery club charges \$8 per lesson. The recreation center charges an initial fee of \$15 plus \$4 per lesson. Complete the tables to show the cost of the lessons at the club and recreation center.

Archery Club

Lessons	1	2	3	4
Cost (\$)				

Recreation Center

Lessons	1	2	3	4
Cost (\$)				

47. Model with mathematics.

a. Write an equation that can be used to find the total cost, y, for the number of visits, x, at the archery club.

b. Write an equation that can be used to find the total cost, y, for the number of visits, x, at the recreation center.

48. Use appropriate tools strategically.

a. Graph the equation you wrote for Item 47a.

b. Graph the equation you wrote for Item 47b.

49. a. What is the slope and y-intercept of the graph in Item 48a?

A. slope = 8; y-intercept = (0, 0)

B. slope = 0; y-intercept = (0, 8)

C. slope = 4; y-intercept = (0, 0)

D. slope = 2; y-intercept = (0, 4)

b. What is the slope and y-intercept of the graph in Item 48b?

A. slope = 15; y-intercept = (0, 0)

B. slope = 4; y-intercept = (0, 15)

C. slope = 4; y-intercept = (0, 0)

D. slope = 15; y-intercept = (4, 0)

50. Attend to precision. Using the information from Items 46–49, where should Jermaine take his archery classes? Explain.

LESSON 13-2

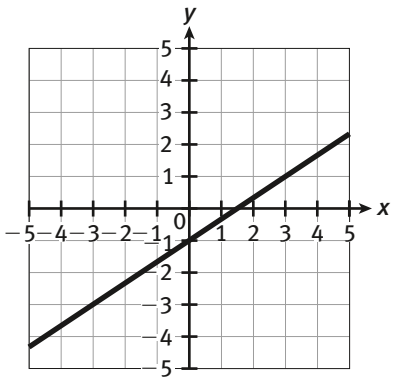
51. Attend to precision. Determine whether each of the following is an example of a directly proportional relationship or not. Explain your reasoning.

a. Chandra swims 4 miles a week.

b. Admission to the fair costs \$5.00 plus \$0.50 for each ride ticket.

c. $y = x^3$

52. Critique the reasoning of others. Hector believes that the following graph shows a directly proportional relationship. Aida disagrees. Who is correct? Justify your response.



53. Model with mathematics. The Chen family is driving from Ohio to Florida on vacation. They drive 260 miles in 4 hours. How many hours would it take them to drive 715 miles?

A. 7 hours

B. 8 hours

C. 11 hours

D. 13 hours

54. Asa is competing in a bicycle race. She currently bikes at a rate of 12 miles per hour.

a. Create a table and graph showing Asa's distance as it relates to the amount of time she bikes.

b. Write an equation to represent the relationship between the time she bikes and the distance she bikes.

c. Is the equation from part b a direct variation equation? Explain your reasoning.

d. If Asa bikes 26.2 miles to complete a bicycle race, how long will it take her to finish the race?

55. Which equation represents a direct variation equation?

A. $y = x^2$

B. $y = x - 2$

C. $y = 5x$

D. $y = \sqrt{x}$

LESSON 14-1

56. Which point is a solution to the system of equations?

$$\begin{cases} y = 2x - 5 \\ y = \frac{1}{2}x - 2 \end{cases}$$

A. (2, 1)

B. (4, 0)

C. (2, −5)

D. (2, −1)

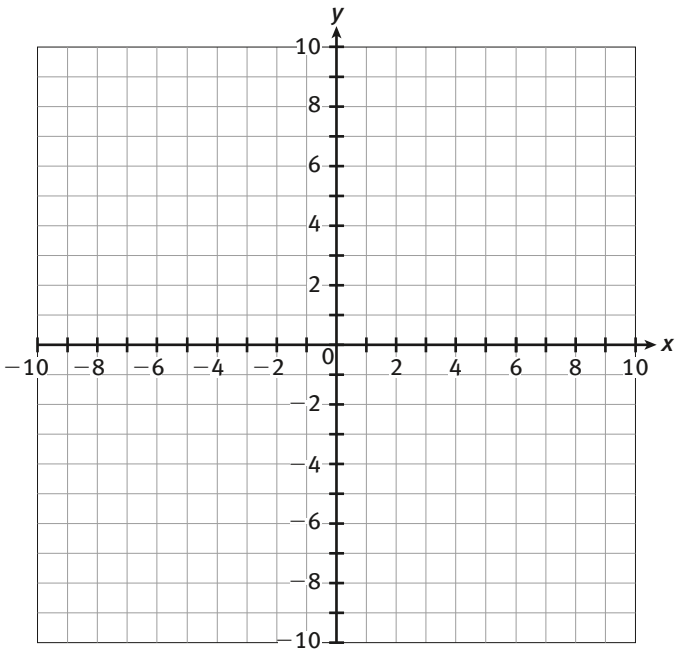
57. Make sense of problems. Create a table of values to determine the solution of the following system of equations.

$$\begin{cases} y = 3x - 6 \\ y = 2x - 5 \end{cases}$$

x	y_1	y_2

58. Model with mathematics. Graph each of the equations below and use your graph to determine at which value of x the values of y are the same.

$$\begin{cases} x+y=-1 \\ 3x+y=3 \end{cases}$$



59. Which point is a solution to the system of equations?

$$\begin{cases} y=2-x \\ y=\frac{3}{2}x-8 \end{cases}$$

A. $(4, -2)$

B. $(2, -8)$

C. $(0, -2)$

D. $(6, -1)$

60. The table below represents deposits to Kento's savings account and to Ella's savings account over the course of 3 weeks.

Week (w)	Kento's account	Ella's account
0	4	12
1	10	17
2	16	22
3	22	27

a. Let K be the amount of money in Kento's account. Write a linear equation that could be used to determine the amount of money in the account in a given week, w.

b. Let E be the amount of money in Ella's account. Write a linear equation that could be used to determine the amount of money in the account in a given week, w.

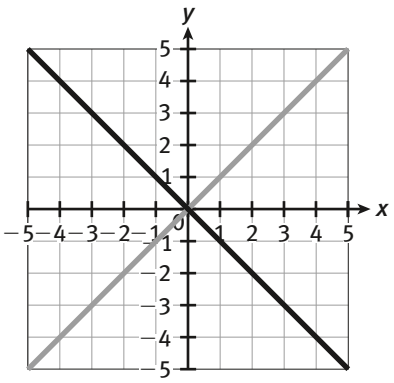
c. Construct viable arguments. In what week will Kento and Ella have the same amount of money in their account? Explain your reasoning.

LESSON 14-2

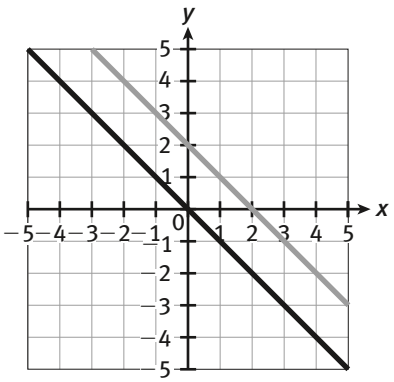
61. Which is the solution to the system of equations?

$$\begin{cases} -x+y=2 \\ x+y=0 \end{cases}$$

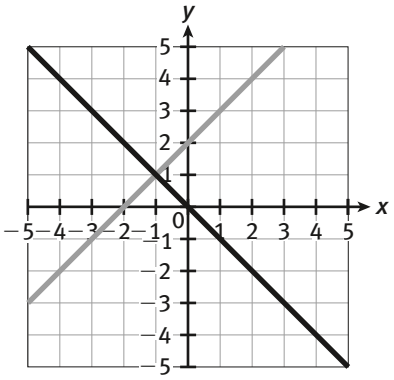
A.



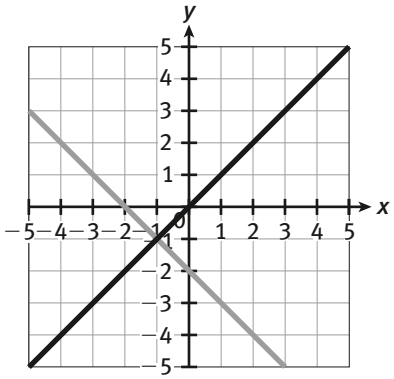
B.



C.



D.



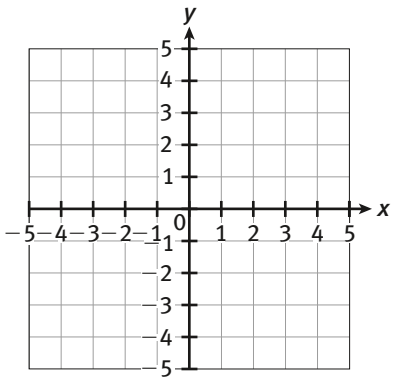
62. Make sense of problems. Solve each of the following systems of equations without graphing. State your solution and the reason for your solution.

a. $\begin{cases} x+y=6 \\ x+y=12 \end{cases}$

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

63. Graph the system of equations and state the solution of the system.

$$\begin{cases} 2x+y=3 \\ 3x-y=4 \end{cases}$$



64. What is the solution to the system of equations?

$$\begin{cases} x+y=-2 \\ y=-6-x \end{cases}$$

A. $(-2, -1)$

B. $(1, -3)$

C. infinitely many solutions

D. no solution

65. Persevere in solving problems. Solve the following system of equations without graphing. State your solution and the reason for the solution.

$$\begin{cases} -4x+2y=0 \\ x-y=-1 \end{cases}$$

LESSON 15-1

66. What is the x-coordinate to the solution of the system of equations?

$$\begin{cases} x+y=9 \\ y=2x \end{cases}$$

A. 2

B. 3

C. 4

D. 6

67. Solve by elimination or linear combination:

$$\begin{cases} 3x+5y=16 \\ -8x+2y=34 \end{cases}$$

68. Which system of equations has no solution?

A. $\begin{cases} x+2y=4 \\ x=2y \end{cases}$

B. $\begin{cases} x+y=4 \\ x-y=2 \end{cases}$

C. $\begin{cases} x-y=4 \\ 2x+2y=8 \end{cases}$

D. $\begin{cases} y=2x+5 \\ -2x+y=9 \end{cases}$

69. Make sense of problems. If the method of substitution results in an equation that is always true, what can you say about the graphs of the two equations?

70. Reason abstractly. Write a system of equations that has a solution of $(3, -4)$. Explain how you determined such a system.

LESSON 15-2

71. Model with mathematics. Mina bought 8 dozen bagels and 3 pounds of cream cheese for $85.50. At the same bakery, Cora bought 4 dozen bagels and 2 pounds of cream cheese for $45. How much does one dozen bagels cost? How much does a pound of cream cheese cost?

72. The sum of two numbers is 96. The difference of the same two numbers is 8. What is the larger number?

A. 34

B. 44

C. 52

D. 58

73. A jar is full of 75 coins. The coins are either quarters or dimes. The value of the coins is $13.65. How many quarters and dimes are in the jar?

74. Tam buys 5 paint brushes and 3 canvases for $170. Wapi buys 6 paint brushes and 5 canvases for $267. How much does one paint brush cost?

A. $5

B. $7

C. $15

D. $18

75. Use appropriate tools strategically. The Vargas family buys 2 adult and 4 child tickets for the zoo and pays a total of $42. The Webster family buys 4 adult tickets and 7 child tickets and pays $79. What is the cost of one adult ticket? What is the cost of one child ticket?