Teacher Packet

i-Ready®

Grade 8 Mathematics

Teacher At-Home Activity Packet

The At-Home Activity Packet includes 18 sets of practice problems that align to important math concepts that have likely been taught this year.

Since pace varies from classroom to classroom, feel free to select the pages that align with the topics your students have covered.

The At-Home Activity Packet includes instructions to the parent and can be printed and sent home.

This At-Home Activity Packet—Teacher Guide includes all the same practice sets as the Student version with the answers provided for your reference.

See the Grade 8 Math concepts covered in this packet!

Grade 8 Math concepts covered in this packet

Applying Properties for Powers with the Same Base

Rewrite each expression as a single power.

1. $6^4 \cdot 6^4$

   6^8

2. $(-5^5)^2$

   5^{10}

3. $\frac{2^9}{2^5}$

   2^4

4. $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3^2$

   3^6

5. $\frac{12^5 \cdot 12^7}{-12^4}$

   -12^8

6. $\left(\frac{7^5}{7^2}\right)^2$

   7^6

Evaluate each expression.

7. $\frac{4^8}{4^5}$

   64

8. $(-10) \cdot (-10)^4$

   $-100{,}000$

9. $\left(\frac{(-3)^4}{(-3)^2}\right)^3$

   729

What value of *x* makes the equation true?

10. $\frac{8^x}{8^5} = 8^7$

    $x = 12$

11. $(-11)^x \cdot (-11)^4 = \frac{(-11)^{10}}{(-11)^3}$

    $x = 3$

12. $(6^x)^{10} = \frac{(6^{12})^2}{6^4}$

    $x = 2$

13. Explain how you solved for *x* in problem 12.

    Possible answer: I know that $(a^m)^n = a^{m \cdot n}$. So, I simplified the left side of the equation to be 6^{10x} and the right side of the equation to be $\frac{6^{24}}{6^4}$. Also, I know $\frac{a^m}{a^n} = a^{m-n}$, so I subtracted the exponents on the right side of the equation. Therefore, $6^{10x} = 6^{20}$. Since $10 \cdot 2 = 20$, $x = 2$.

Applying Properties for Powers with the Same Exponent

Rewrite each expression as a single power.

1. $9^4 \cdot 10^4$

   90^4

2. $(12 \cdot 6)^3$

   72^3

3. $\frac{3^3}{2^3}$

   $\left(\frac{3}{2}\right)^3$

4. $\frac{6^2}{2^2}$

   3^2

5. $(-5)^6 \cdot (-7)^6$

   35^6

6. $\left(\frac{6^4}{12^4}\right)^2$

   $\left(\frac{1}{2}\right)^8$

Rewrite each expression as a product of two powers or quotient of two powers.

7. $5^5(16^2 \cdot 5^3)^3$

   $16^6 \cdot 5^{14}$

8. $\left(\frac{8^4 \cdot 5^3}{8^5}\right)^2$

   $\frac{5^6}{8}$

9. $\left(\frac{5^8 \cdot 3^7}{5^4}\right)^{10}$

   $5^{40} \cdot 3^{70}$

10. How does multiplying powers with the same base differ from multiplying powers with the same exponent but different bases?

    Possible answer: When powers with the same base are multiplied, the bases remain the same and the exponents are added. When powers with the same exponent but different bases are multiplied, the bases are multiplied and the exponents remain the same.

Applying Properties of Negative Exponents

➤ **Rewrite each expression using only positive exponents. The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.**

1. $7^3 \cdot 16^{-9}$

   $\frac{7^3}{16^9}$

2. $\frac{8^{-6}}{21^{-4}}$

   $\frac{21^4}{8^6}$

3. $\left(\frac{7}{16}\right)^{-3}$

   $\frac{16^3}{7^3}$

4. $16^3 \cdot (-7)^{-3}$

   $\frac{16^3}{(-7)^3}$

5. $(8 \cdot 21)^{-4}$

   $\frac{1}{(8 \cdot 21)^4}$

6. $8 \cdot 21^{-3}$

   $\frac{8}{21^3}$

7. $\frac{11^{-7} \cdot 5^9}{6^9}$

   $\frac{5^9}{11^7 \cdot 6^9}$

8. $\frac{11^{-7} \cdot 5^9}{6^{-9}}$

   $\frac{6^9 \cdot 5^9}{11^7}$

9. $6^9 \cdot 11^{-7} \cdot 5^{-9}$

   $\frac{6^9}{11^7 \cdot 5^9}$

10. $\frac{3^5 \cdot (-4)^{-10}}{7^9 \cdot 21^{-4}}$

    $\frac{3^5 \cdot 21^4}{7^9 \cdot (-4)^{10}}$

11. $\frac{(-21)^{-4} \cdot (-4)^0}{3^{-5} \cdot 7^{-9}}$

    $\frac{3^5 \cdot 7^2}{(-21)^4}$

12. $\left(\frac{3}{7}\right)^{-5} \cdot (-21)^{-4} \cdot (-4)^2$

    $\frac{7^5 \cdot (-4)^2}{3^5 \cdot (-21)^4}$

Answers

$\frac{1}{(8 \cdot 21)^4}$	$\frac{6^9}{11^7 \cdot 5^9}$	$\frac{16^3}{7^3}$	$\frac{7^5 \cdot (-4)^2}{3^5 \cdot (-21)^4}$
$\frac{21^4}{8^6}$	$\frac{6^9 \cdot 5^9}{11^7}$	$\frac{16^3}{(-7)^3}$	$\frac{3^5 \cdot 21^4}{7^9 \cdot (-4)^{10}}$
$\frac{3^5 \cdot 7^2}{(-21)^4}$	$\frac{8}{21^3}$	$\frac{5^9}{11^7 \cdot 6^9}$	$\frac{7^3}{16^9}$

Applying Properties of Integer Exponents

Evaluate each expression.

1. $18^{-4} \cdot 6^7$

   $\frac{8}{3}$

2. $3^4 \cdot 3^{-6} \cdot 9^0$

   $\frac{1}{9}$

3. $\left(\frac{3^{-4} \cdot 3^6}{6^3 \cdot 6^{-1}}\right)^{-2}$

   16

Write each expression using only positive exponents.

4. $19^{-3} \cdot 19 \cdot 19^{-4} \cdot 19^3$

   $\frac{1}{19^3}$

5. $\frac{6^{-3} \cdot 17^3 \cdot 2}{6^5 \cdot 17^{-4} \cdot 2^{-1}}$

   $\frac{17^7 \cdot 2^2}{6^8}$

6. $24^{-3} \cdot 24^7 \cdot (24^{-3})^4 \cdot 24^9$

   24

7. $\left(\frac{7^{-3} \cdot 3^{-8}}{7^{-2} \cdot 3^{-2}}\right)^{-4}$

   $7^4 \cdot 3^{24}$

8. $(2^{-1} \cdot 3^0)^{-3} \cdot (2^0 \cdot 5^3)^5$

   $2^3 \cdot 5^{15}$

9. $\left(\frac{5^6 \cdot 3^{-3}}{3^{-3}}\right)^4$

   5^{24}

10. How could you have simplified problem 7 in a different way?

    Possible answer: I simplified in the parentheses first by subtracting the exponents of 7 and the exponents of 3. Then I multiplied the resulting exponents by −4. I could have multiplied the exponents by −4 before subtracting the exponents.

Writing Numbers in Scientific Notation

➤ **Write each number in scientific notation.**

1. 8

   8×10^{0}

2. 54

   5.4×10^{1}

3. 0.02

   2×10^{-2}

4. 229

   2.29×10^{2}

5. 187

   1.87×10^{2}

6. 0.452

   4.52×10^{-1}

7. 0.006009

   6.009×10^{-3}

8. 452

   4.52×10^{2}

9. 35,710

   3.571×10^{4}

10. 0.00005026

    5.026×10^{-5}

11. 787,000

    7.87×10^{5}

12. 45.2

    4.52×10^{1}

13. $934\frac{1}{2}$

    9.345×10^{2}

14. 0.000000452

    4.52×10^{-7}

15. 11,235,000,000

    1.1235×10^{10}

16. How are the answers to problems 6, 8, 12, and 14 similar? How are they different?
    Possible answer: When writing these numbers in scientific notation, they all begin with 4.52. The power of 10 is different.

Adding and Subtracting with Scientific Notation

➤ **Find each sum or difference. Write your answer in scientific notation.**

1. $(6 \times 10^1) + (9 \times 10^1)$

   1.5×10^2

2. $32 - (2.1 \times 10^1)$

   1.1×10^1

3. $(7 \times 10^0) + (3 \times 10^1)$

   3.7×10^1

4. $100 - (1.4 \times 10^1)$

   8.6×10^1

5. $(8.8 \times 10^2) + (3 \times 10^2)$

   1.18×10^3

6. $(3.05 \times 10^2) + 64$

   3.69×10^2

Adding and Subtracting with Scientific Notation *continued*

7. $(4 \times 10^2) + 120.5$

   5.205×10^2

8. $(2.75 \times 10^3) - 100$

   1.75×10^3

9. $(9.5 \times 10^2) - (4.3 \times 10^1)$

   9.07×10^2

10. $18 - (2 \times 10^{-1})$

    1.798×10^2

11. $0.071 + (6 \times 10^{-2})$

    1.31×10^{-1}

12. $2{,}000 + (8 \times 10^3)$

    8.2×10^3

13. When adding or subtracting with scientific notation, why is it important to have the same power of 10?

    Possible answer: Writing both numbers with the same power of 10 aligns the place values before adding or subtracting.

Multiplying and Dividing with Scientific Notation

➤ **Find each product or quotient. Write your answer in scientific notation.**

1. $(3.6 \times 10^1) \div 6$

   6×10^0

2. $(2 \times 10^2) \times (3 \times 10^1)$

   6×10^3

3. $7 \times (2 \times 10^1)$

   1.4×10^2

4. $(2.5 \times 10^0) \times (1.5 \times 10^1)$

   3.75×10^1

5. $(4 \times 10^2) \div (4 \times 10^1)$

   1×10^1

6. $45 \div (5 \times 10^0)$

   9×10^0

Multiplying and Dividing with Scientific Notation *continued*

7 $(2.5 \times 10^2) \times 5$

1.25×10^3

8 $900 \div (4.5 \times 10^0)$

2×10^2

9 $(4 \times 10^5) \times 0.0375$

1.5×10^4

10 $(6 \times 10^{-10}) \div (2.5 \times 10^{-12})$

2.4×10^2

11 $(2.8 \times 10^{-7}) \times (7 \times 10^{12})$

1.96×10^2

12 $0.000068 \div (2 \times 10^8)$

3.4×10^{-13}

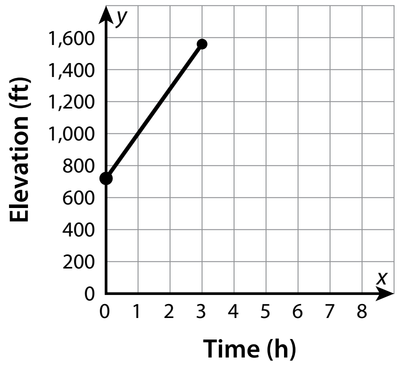
13 How do you divide two numbers in scientific notation?

Possible answer: To divide two numbers in scientific notation, divide the number factors and then subtract the exponents of the powers of 10.

Interpreting a Linear Function

➤ **Interpret the linear function to solve the problems. Show your work.**

1. A group of volunteers is spending a week cleaning up the trails in the Hudson Highlands. On day 2 the volunteers begin at the point on the trail where they ended the day before. The graph shows their elevation, in feet, as a function of the number of hours they work to clean the trails.



a. What does the ordered pair (1, 1000) on the graph represent?

They were at an elevation of 1,000 feet after 1 hour of work.

b. The graph begins at 720 on the *y*-axis. What does this value represent? Is this the rate of change or the initial value?

It represents the elevation where they began their work. This is the initial value.

c. By how many feet does the elevation increase for one hour of work? What does this value represent, rate of change or initial value?

280 feet; This is the rate of change.

d. What is the equation that represents this function?

$y = 280x + 720$

2. The table shows number of people as a function of time in hours. Write an equation for the function and describe a situation that it could represent. Include the initial value, rate of change, and what each quantity represents in the situation.

Hours	Number of People
1	150
3	250
5	350

$y = 50x + 100$; Possible answer: A carnival opens at 5:00 PM, and the carnival attendance is estimated each hour after opening. The initial value is 100 and represents the number of people that were there at 5:00 PM. The rate of change is 50 and represents the number of people that enter each hour.

Interpreting a Linear Function *continued*

3 Amber plans to cook a turkey and macaroni and cheese for a special dinner. Since she will need to use the oven for both dishes, and they won't both fit in the oven at the same time, she has to determine how much time all the cooking will take. The macaroni and cheese will take a set amount of time, while the turkey takes a certain number of minutes per pound that the turkey weighs.

The equation models the total cooking time Amber will need to prepare her dishes.

$$y = 15x + 40$$

a. What do variables x and y represent? Use the phrase *is a function of* to describe how the two quantities relate to each other.

x represents the weight of the turkey in pounds; y represents the total cooking time; The total cooking time is a function of the weight of the turkey.

b. What does the value 40 represent?

It represents the cooking time for the macaroni and cheese only.

c. What does the rate of change represent?

The rate of change, 15, represents the number of minutes per pound the turkey has to cook.

d. What is the total cooking time for just the turkey if it weighs 12 pounds? How do you know?

180 minutes; Possible answer: The rate of change is 15 minutes per pound, and $15(12) = 180$.

Writing an Equation for a Linear Function from a Verbal Description

➤ **Write an equation for each linear function described. Show your work.**

1. The graph of the function passes through the point (2, 1), and y increases by 4 when x increases by 1.

   $y = 4x - 7$

2. the function with a rate of change of $\frac{3}{2}$ whose graph passes through the point (4, 10.5)

   $y = \frac{3}{2}x + \frac{9}{2}$

3. the function with a rate of change of $\frac{4}{5}$ that has a value of 10 at $x = 10$

   $y = \frac{4}{5}x + 2$

4. the function that has an x-intercept of -2 and a y-intercept of $-\frac{2}{3}$

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

5. Cameron stops to get gas soon after beginning a road trip. He checks his distance from home 2 hours after filling his gas tank and checks again 3 hours later. The first time he checked, he was 170 miles from home. The second time, he was 365 miles from home. What equation models Cameron's distance from home as a function of the time since getting gas?

   $y = 65x + 40$

6. A charity organization is holding a benefit event. It receives $28,000 in donations and $225 for each ticket sold for the event. What equation models the total amount earned from the event as a function of the number of tickets sold?

   $y = 225x + 28{,}000$

Writing an Equation for a Linear Function from a Verbal Description *continued*

7 The same charity organization from problem 6 has to pay $4,700 for the banquet hall as well as $110 per plate for each ticket sold.

a. What equation models the total amount spent as a function of the number of tickets sold?

$y = 110x + 4{,}700$

b. Using your answer from problem 6, write an equation for the charity's profit as a function of ticket sales. (profit = amount earned − amount spent)

$y = 115x + 23{,}300$

8 A school pays $1,825 for 150 shirts. This includes the $25 flat-rate shipping cost.

a. What equation models the total cost as a function of the number of T-shirts ordered?

$y = 12x + 25$

b. What does each variable represent?

***x* represents the number of shirts purchased, and *y* represents the total cost.**

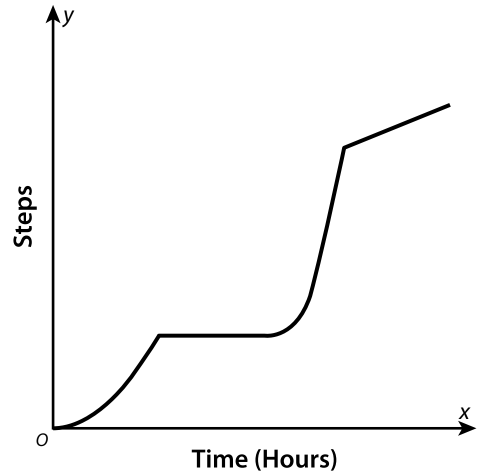
c. What are the initial value and rate of change of the function? What does each one represent?

The initial value, 25, represents the flat-rate shipping cost. The rate of change, 12, is the cost per T-shirt.

Using Graphs to Describe Functions Qualitatively

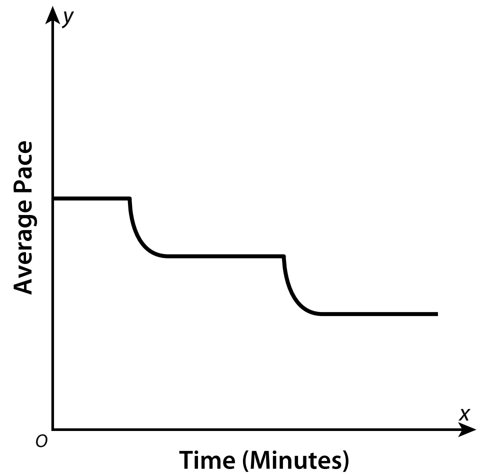
➤ **Tell a story that could be represented by the graph shown.**

1 The graph represents steps taken as a function of time.



Possible answer: Jason starts off walking slowly, gradually increasing his steps. He then sits still for several hours before very quickly increasing his steps. After that he continues moving, but at a slower rate.

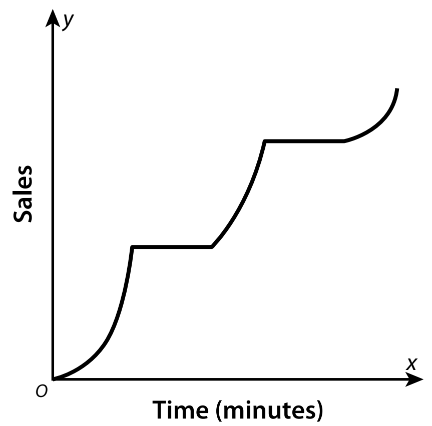
2 The graph represents average pace as a function of time.



Possible answer: A runner starts to run at an even pace; then her pace quickly decreases at a varying rate. She then runs at a slower steady pace. Her pace quickly decreases at a varying rate again. She then maintains a steady pace until the end of her run.

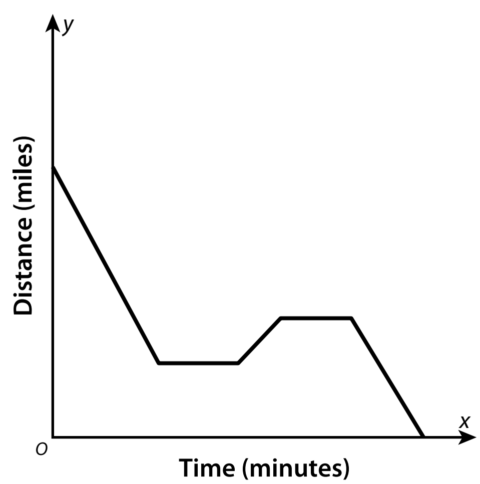
Using Graphs to Describe Functions Qualitatively *continued*

3 The graph shows sales as a function of time.



Possible answer: Concession stand sales increase rapidly at a varying rate before a game starts. Sales stop during the first half of the game and then increase quickly during half time. The sales stop again during the second half of the game and then increase at a varying rate after the game is over.

4 The graph shows distance as a function of time.



Possible answer: Mrs. Workum is driving toward her home at a constant rate. She stops to drop a friend at her house and stays for a few minutes. Mrs. Workum then drives to the store and is there for a few minutes before continuing to her home.

5 For an interval on a graph that shows that a change is happening, explain how the shape of the graph on that interval tells you whether the change is happening gradually or quickly.

Possible answer: The steeper a line or part of a curve is, the more quickly the change is happening.

Finding the Slope of a Line

➤ **Use the information provided to find the slope of each line. State what the slope represents.**

1.

Seconds	0	5	10
Feet	0	30	60

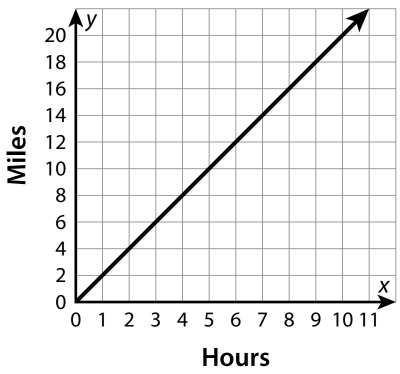
6; feet per second

2.

Hours	0	2	5
Dollars	0	18	45

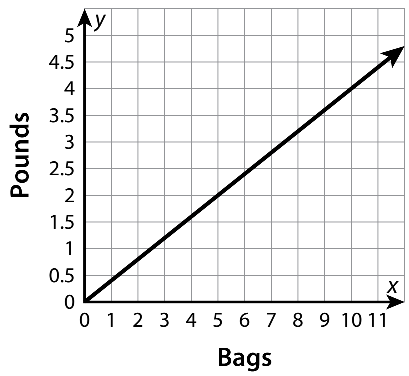
9; dollars per hour

3.



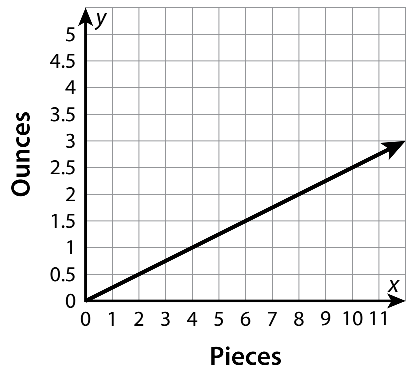
2; miles per hour

4.



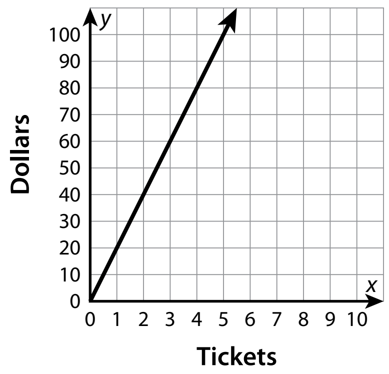
$\frac{2}{5}$; pounds per bag

5.



$\frac{1}{4}$; ounces per piece

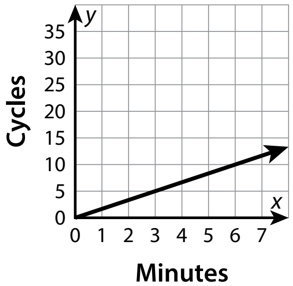
6.



20; dollars per ticket

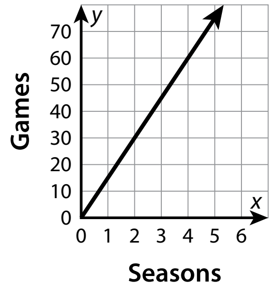
Finding the Slope of a Line *continued*

7



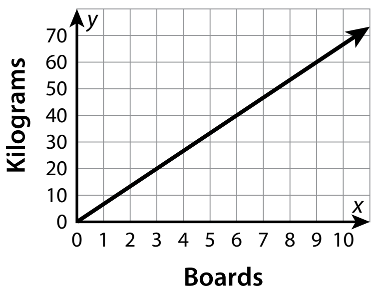
$\frac{5}{3}$; cycles per minute

8



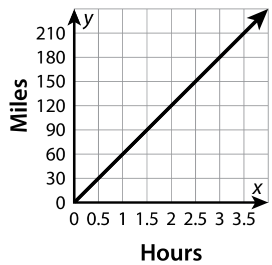
15; games per season

9



$\frac{20}{3}$; kilograms per board

10



60; miles per hour

11 Compare finding the slope using a table and using a graph.

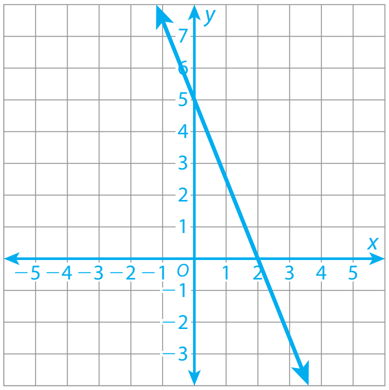
Possible answer: When using a table, the coordinates are given to you. When using a graph, you have to determine the coordinates by looking at the graph. When using a table and a graph, you need to find the ratio of the vertical change (*y*-values) to the horizontal change (*x*-values) between two points.

Graphing a Linear Equation Given in Any Form

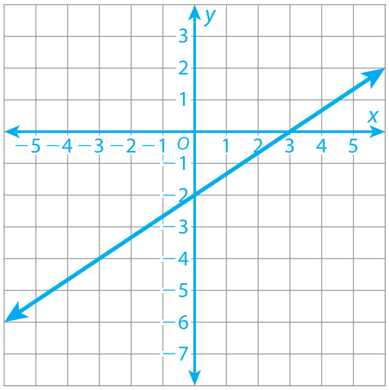
➤ **Graph each linear equation on the grid provided. Be sure to label the units on the *x*- and *y*-axes.**

Possible graphs are shown.

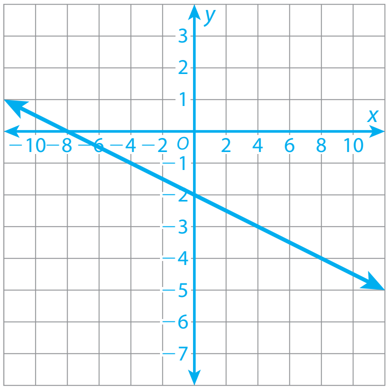
1 $5x + 2y = 10$



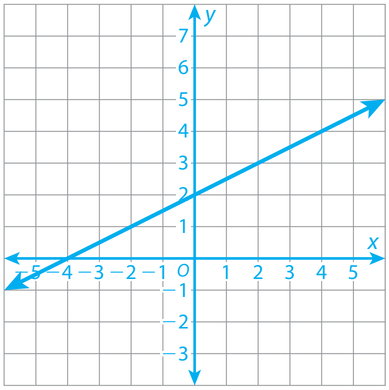
2 $200x - 300y = 600$



3 $-\frac{1}{2}x - 2y = 4$

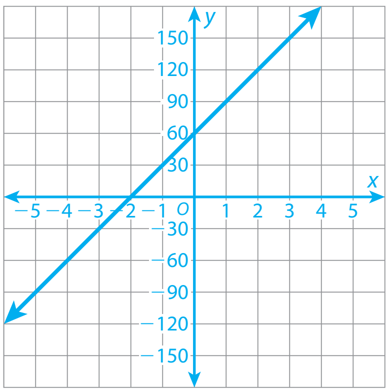


4 $6x - 12y + 24 = 0$

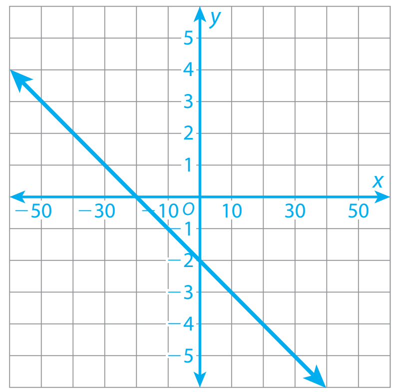


Graphing a Linear Equation Given in Any Form *continued*

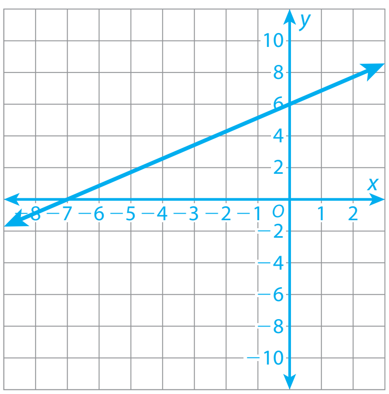
5 $-150x + 5y = 300$



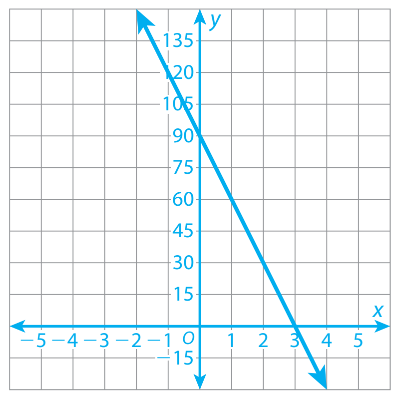
6 $-4x - 40y - 80 = 0$



7 $-6x + 7y = 42$



8 $10x + \frac{1}{3}y = 30$



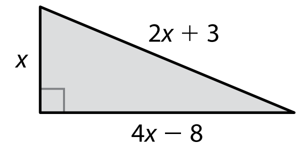
9 Which method do you prefer for graphing linear equations that are not in the form $y = mx + b$?

Possible answer: I prefer to substitute 0 for *x* and then for *y* to find the intercepts. Rearranging the terms into slope-intercept form usually requires more steps.

Representing and Solving Problems with One-Variable Equations

➤ **Write and solve an equation to answer each question.**

1 The perimeter of the triangle shown is 30 inches. What is the length of the longest side of the triangle?



$x + (2x + 3) + (4x - 8) = 30$; 13 in.

2 Two times the quantity of seven less than one-fourth of a number is equal to four more than one-third of the number. What is the number?

$2\left(\frac{1}{4}n - 7\right) = \frac{1}{3}n + 4$; 108

3 Amanda uses a rectangular canvas for a painting. The length is $6x - 3$ centimeters. The width is $2x + 6$ centimeters, and is $\frac{4}{5}$ of the length. What are the dimensions of the canvas?

$\frac{4}{5}(6x - 3) = 2x + 6$; The length is 15 cm, and the width is 12 cm.

4 Three friends fill bags with trash at a neighborhood cleanup. Randall's bag weighs $3x - 7$ pounds, Seth's bag weighs $2x - 10$ pounds, and Joanna's bag weighs $2x + 2$ pounds. Together, Randall's and Joanna's bags weigh 3 times as much as Seth's bag. How many pounds of trash does each friend pick up?

$(3x - 7) + (2x + 2) = 3(2x - 10)$; Randall picks up 68 pounds, Joanna picks up 52 pounds, and Seth picks up 40 pounds.

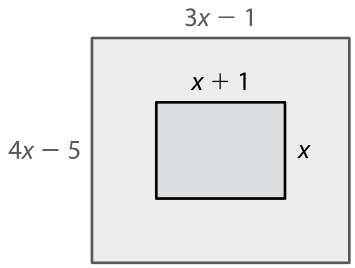
Representing and Solving Problems with One-Variable Equations *continued*

5 Eli and Angela are saving money to buy their grandparents an anniversary gift. Eli has saved $8 more than $\frac{1}{3}$ of Angela's savings. If they each save $10 more, Eli will have saved $4 more than Angela's savings. How much has Eli saved?

$\frac{1}{3}a + 8 + 10 = a + 4 + 10$; $10

6 The perimeter of the larger rectangle is 2 meters greater than twice the perimeter of the smaller rectangle. What is the perimeter of the larger rectangle?

$2(3x - 1) + 2(4x - 5) = 2[2(x + 1) + 2x] + 2$; 30 m



Solving Systems of Linear Equations by Substitution

➤ **Find the solution of each system of equations.**

1. $y = 2x - 1$

   $y = 3x + 2$

   $(-3, -7)$

2. $x = y + 4$

   $2x + 2y = 16$

   $(6, 2)$

3. $x + y = 5$

   $6x + 3y = 27$

   $(4, 1)$

4. $5x + 2y = 10$

   $2x + y = 2$

   $(6, -10)$

5. $4x - 8y = -26$

   $9x + 4y = 13$

   $\left(0, \frac{13}{4}\right)$

6. $2x - 3y = 24$

   $2x + y = 4$

   $\left(\frac{9}{2}, -5\right)$

7. How do you decide which variable to substitute when solving a system of equations by substitution? Explain.

   Possible answer: If neither equation is already solved for one of the variables, I look for an equation with a variable that has a coefficient of 1 and solve the equation for that variable.

Solving Systems of Linear Equations by Elimination

➤ **Find the solution to each system of equations.**

1. $4x - 12y = -8$

   $-3x + 12y = 12$

   (4, 2)

2. $6x - 9y = 18$

   $-6x + 2y = -4$

   (0, −2)

3. $6x + 3y = 3$

   $3x - y = 4$

   (1, −1)

4. $-3x + 2y = -17$

   $-6x + 3y = -30$

   (3, −4)

5. $7x + 6y = 16$

   $4x - 2y = 1$

   $\left(1, \frac{3}{2}\right)$

6. $16x + 5y = -2$

   $4x - y = -2$

   $\left(-\frac{1}{3}, \frac{2}{3}\right)$

7. When using the elimination method to solve a system of equations, how do you choose which variable to eliminate?

   Possible answer: I choose the variable whose coefficients have the lesser least common multiple.

Solving Real-World Problems with Systems of Linear Equations

➤ **Solve the problems by solving a system of equations.**

1. Otis paints the interior of a home for \$45 per hour plus \$75 for supplies. Shireen paints the interior of a home for \$55 per hour plus \$30 for supplies. The equations give the total cost for x hours of work for each painter. For how many hours of work are Otis's and Shireen's costs equal? What is the cost for this number of hours?

$$y = 45x + 75$$

$$y = 55x + 30$$

4.5 hours; \$277.50

2. Calvin has 13 coins, all of which are quarters or nickels. The coins are worth \$2.45. How many of each coin does Calvin have?

$$q + n = 13$$

$$0.25q + 0.05n = 2.45$$

9 quarters and 4 nickels

3. There are 47 people attending a play at an outdoor theater. There are 11 groups of people sitting in groups of 3 or 5. How many groups of each size are there?

$$t + f = 11$$

$$3t + 5f = 47$$

7 groups of five and 4 groups of three

4. Agnes has 23 collectible stones, all of which are labradorite crystals or galena crystals. Labradorite crystals are worth \$20 each, while galena crystals are worth \$13 each. Agnes earns \$439 by selling her entire collection. How many stones of each type did she sell?

$$\ell + g = 23$$

$$20\ell + 13g = 439$$

20 labradorite crystals and 3 galena crystals

Solving Real-World Problems with Systems of Linear Equations *continued*

5 A dog groomer buys 7 packages of treats. Gourmet treats are sold in packs of 2. Treats that help clean a dog's teeth are sold in packs of 5. The dog groomer buys 26 treats in all. How many packages of each did she buy?

$g + c = 7$

$2g + 5c = 26$

3 packages of gourmet treats and

4 packages of teeth-cleaning treats

6 Copland competes in 27 swimming events this season. He wins either first place or second place in each event. Copland has 3 more first-place wins than second-place wins. In how many events did he win first place, and in how many did he win second place?

$f + n = 27$

$f - n = 3$

15 events are first-place wins, and

12 events are second-place wins.

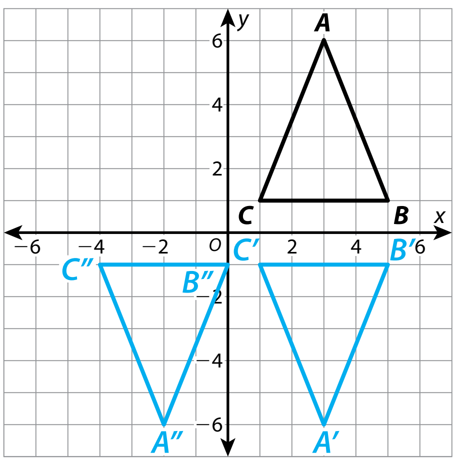
7 Choose one problem from problems 1–6. Check your answer by solving the system of equations in a different way.

Answers will vary.

Performing Sequences of Rigid Transformations

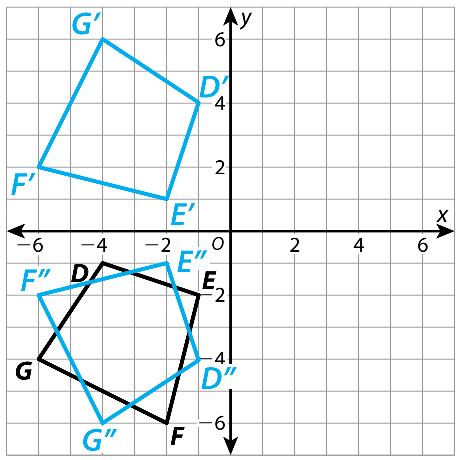
➤ **Perform the given sequence of transformations on each figure. Write the coordinates of the vertices of the final image. Then tell whether the final image is congruent to the original figure.**

1 Reflect across the *x*-axis.
Translate 5 units left.



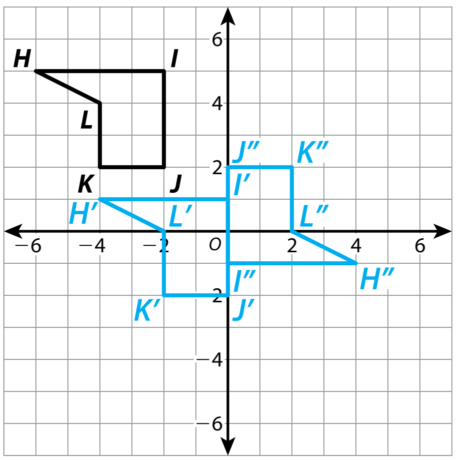
A″(−2, −6), *B*″(0, −1), *C*″(−4, −1); congruent

2 Rotate 90° clockwise around the origin.
Reflect across the *x*-axis.



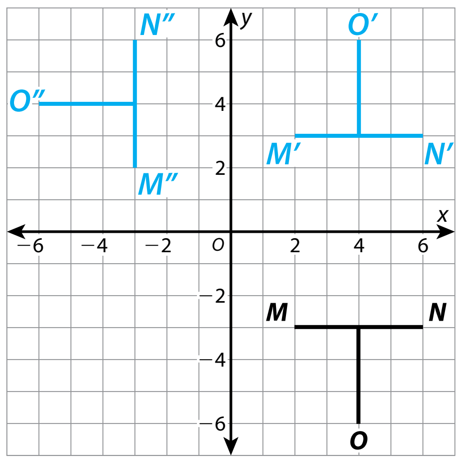
D″(−1, −4), *E*″(−2, −1), *F*″(−6, −2), *G*″(−4, −6); congruent

3 Translate 2 units right and 4 units down.
Rotate 180° around the origin.



H″(4, −1), *I*″(0, −1), *J*″(0, 2), *K*″(2, 2), *L*″(2, 0); congruent

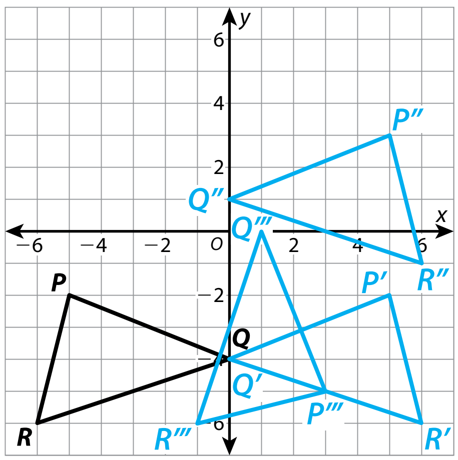
4 Reflect across the *x*-axis. Rotate 90° counterclockwise around the origin.



M″(−3, 2), *N*″(−3, 6), *O*″(−6, 4); congruent

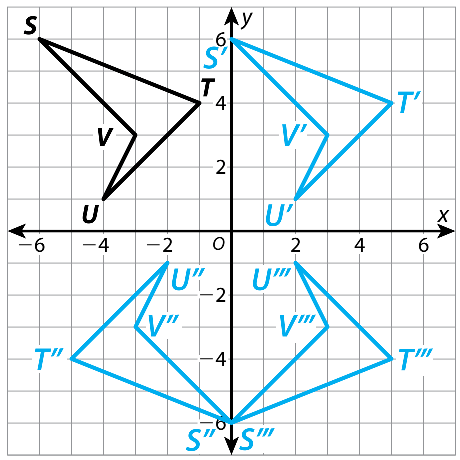
Performing Sequences of Rigid Transformations *continued*

5 Reflect across the *y*-axis.
Translate 5 units up.
Rotate 90° clockwise around the origin.



$P'''(3, -5), Q'''(1, 0), R'''(-1, -6)$; congruent

6 Translate 6 units right.
Rotate 180° around the origin.
Reflect across the *y*-axis.



$S'''(0, -6), T'''(5, -4), U'''(2, -1), V'''(3, -3)$; congruent

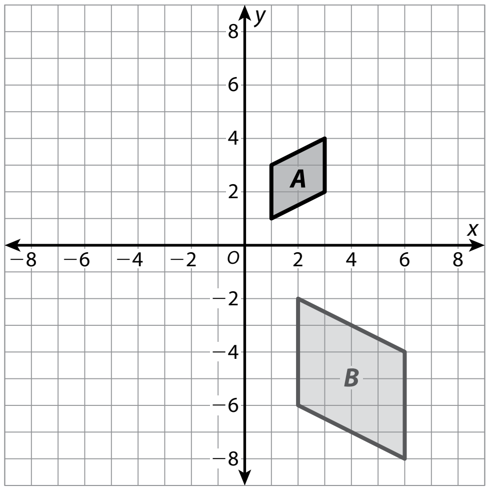
7 How did you determine the label for each vertex when you transformed the triangles in problem 5?

Possible answer: As I performed each transformation, I labeled the corresponding vertices in the new triangle with the same letter as in the original triangle and added one more prime symbol.

Describing Sequences of Transformations Involving Dilations

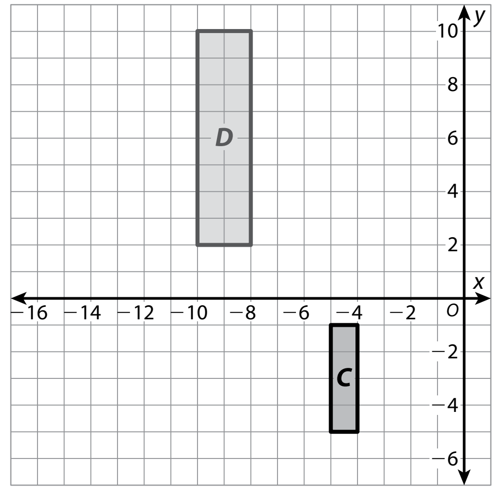
➤ **For each pair of figures, describe a sequence of three or fewer transformations that can be used to map one figure onto the other.**

1



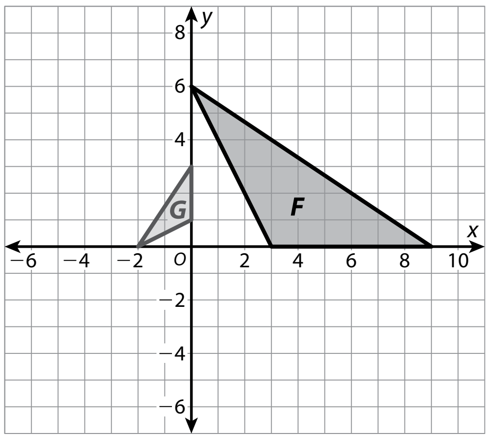
Possible answer: Reflect *B* across the *x*-axis and dilate by a scale factor of $\frac{1}{2}$ with center at the origin.

2



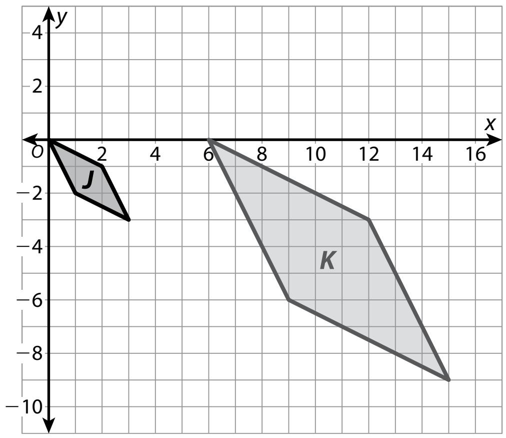
Possible answer: Dilate *C* by a scale factor of 2 with the center of dilation at the origin and translate 12 units up.

3



Possible answer: Rotate *G* 90° clockwise around the origin and dilate by a scale factor of 3 with the center of dilation at the origin.

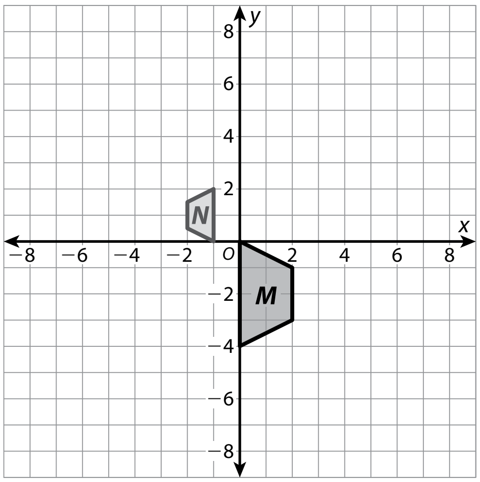
4



Possible answer: Dilate figure *K* by a scale factor of $\frac{1}{3}$ with the center of dilation at the origin and then translate 2 units to the left.

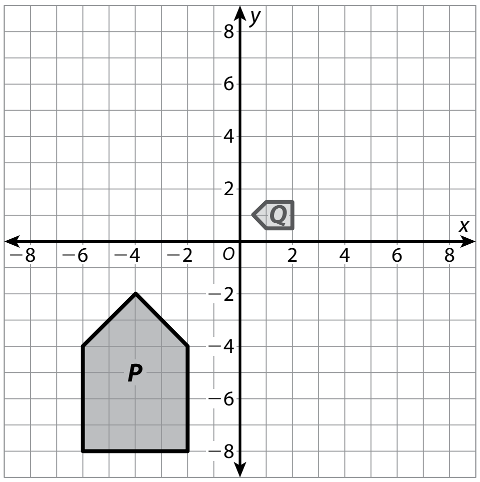
Describing Sequences of Transformations Involving Dilations *continued*

5



Possible answer: Rotate *M* 180° clockwise around the origin, dilate by a scale factor of $\frac{1}{2}$ with the center of dilation at the origin, and translate 1 unit to the left.

6



Possible answer: Reflect *P* across the *x*-axis, rotate 90° clockwise around the origin, and dilate by a scale factor of $\frac{1}{4}$ with the center of dilation at the origin.

7 Give an example of a sequence of transformations that can be performed in any order and will result in the same image.

Possible answer: I can reflect a triangle and then dilate it, or dilate it first and then reflect it.

8 Give an example of a sequence of transformations for which changing the order results in a different final image.

Possible answer: If I translate a rectangle and then dilate it, the result is different than if I dilate it first and then translate it.