

**5.1 Practice A****Find the product. List the units.**

1.  $12 \text{ h} \times \frac{\$5}{\text{h}}$

2.  $6 \text{ oz} \times \frac{\$0.59}{\text{oz}}$

3.  $9 \text{ h} \times \frac{70 \text{ mi}}{\text{h}}$

**Write the ratio as a fraction in simplest form.**

4. 12 to 15

5. 24 : 9

6. 14 tetras : 6 angelfish

**Find the unit rate.**

7. 360 miles in 6 hours

8. 18 bowlers on 6 lanes

9. \$28 for 7 people

**Use the ratio table to find the unit rate with respect to the specified units.**

10. Laps per minute

Minutes	0	2	4	6
Laps	0	1	2	3

11. Grams of protein per serving

Servings	0	1	2	3
Grams of Protein	0	15	30	45

12. At 9 A.M. you have run 2 miles. At 9:24 A.M. you have run 5 miles. What is your running rate in minutes per mile?

13. Are the two statements equivalent? Explain your reasoning.

- The ratio of orange to blue is 3 to 4.
- The ratio of blue to orange is 12 to 9.

14. There are 234 students in 9 different classrooms. What is the ratio of students to classrooms?

15. Dishwasher detergent is sold in individual packs. It is sold in 20-, 60-, and 90-pack containers.

- Which container do you think has the lowest unit rate of dollars per pack? Why?
- The 20-pack container sells for \$5.49. What is the unit rate in dollars per pack? Round your answer to the nearest cent.
- The 60-pack container sells for \$10.97. What is the unit rate in dollars per pack? Round your answer to the nearest cent.
- The 90-pack container sells for \$18.95. What is the unit rate in dollars per pack? Round your answer to the nearest cent.
- Which container has the lowest unit rate? How does this compare with your answer in part (a)?

**5.2 Practice A**

**Tell whether the ratios form a proportion.**

1.  $\frac{1}{4}, \frac{3}{12}$

2.  $\frac{1}{7}, \frac{4}{28}$

3.  $\frac{2}{5}, \frac{30}{80}$

4.  $\frac{18}{24}, \frac{15}{20}$

5.  $\frac{35}{16}, \frac{5}{2}$

6.  $\frac{5}{7}, \frac{35}{49}$

7.  $\frac{15}{21}, \frac{40}{56}$

8.  $\frac{33}{63}, \frac{26}{42}$

9.  $\frac{54}{10}, \frac{81}{15}$

**Tell whether the two rates form a proportion.**

10. 8 feet in 15 seconds; 16 feet in 40 seconds
11. 28 people in 4 rooms; 63 people in 9 rooms
12. 14 girls to 6 boys; 35 girls to 15 boys
13. 45 marbles in 9 bags; 150 marbles in 36 bags
14. You can run 4 laps in 10 minutes. Your friend can run 6 laps in 15 minutes. Are these rates proportional? Explain.

**Tell whether the ratios form a proportion.**

15.  $\frac{7}{4}, \frac{17.5}{10}$

16.  $\frac{1.5}{6}, \frac{2}{8}$

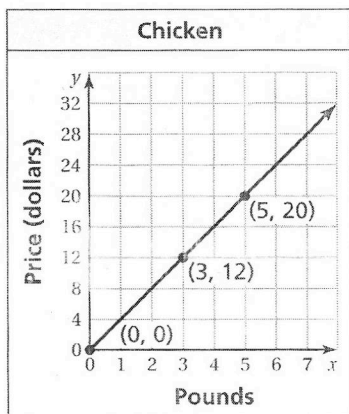
17.  $\frac{8}{5}, \frac{68}{45}$

18. You get \$27 to spend at the mall for doing 6 chores. Your friend gets \$36 for doing 8 chores.
  - a. What is your pay rate?
  - b. What is your friend's pay rate?
  - c. Are the pay rates equivalent? Explain.
19. You can buy 4 tickets for \$75 or 5 tickets for \$94. Are the costs proportional? If not, rewrite one of the rates so the costs are proportional.
20. A recipe requires a ratio of 4 potatoes to 6 carrots. You accidentally use 5 potatoes with 6 carrots. What is the least number of potatoes and carrots that you can add to get the correct ratio of potatoes to carrots?

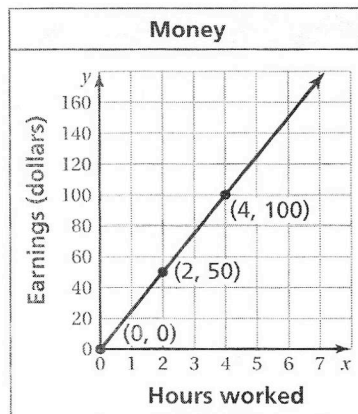
# Extension 5.2 Practice

Interpret each plotted point in the graph of the proportional relationship.

1.



2.



The graph of a proportional relationship passes through the given points. Find  $y$ .

3.  $(4, 8), (1, y)$

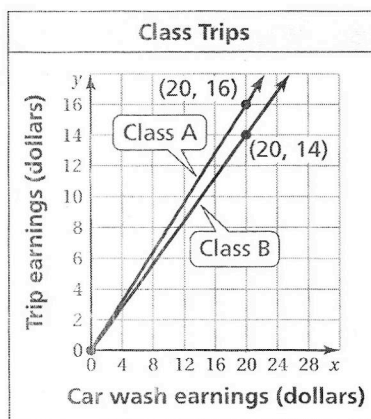
4.  $(3, 21), (1, y)$

5.  $(1.5, 9), (1, y)$

6.  $(3.5, 14), (1, y)$

7. Two classes have car washes to raise money for class trips. A portion of the earnings will pay for using the two locations for the car washes. The graph shows that the trip earnings of the two classes are proportional to the car wash earnings.

- Express the trip earnings rate for each class as a percent.
- What trip earnings does Class A receive for earning \$75 from the car wash?
- How much less does Class B receive than Class A for earning \$75 from the car wash?



## 5.3 Practice A

Write a proportion to find how many points a student needs to earn on the test to get the given score.

1. test worth 70 points; test score of 90%      2. test worth 30 points; test score of 72%

Write a proportion to find how many free throws a player needs to get the given score.

3. 15 free-throw attempts; free-throw score of 60%  
4. 24 free-throw attempts; free-throw score of 75%

Use the table to write a proportion.

5.

	August	September
Hurricanes	2	1
Storms	6	$n$

6.

	Day 1	Day 2
Wins	$w$	8
Races	21	12

7. The county requires 2 teachers for every 45 students. Write a proportion that gives the number  $t$  of teachers needed for 315 students.

Solve the proportion.

8.  $\frac{2}{3} = \frac{a}{15}$

9.  $\frac{4}{7} = \frac{44}{m}$

10.  $\frac{d}{6} = \frac{72}{48}$

11. A paint color requires the ratio of green paint to yellow paint to be 4 : 9.
- A container of this paint has 36 pints of yellow paint. Write a proportion that gives the number  $g$  of pints of green paint in the container.
  - How many pints of green paint are in the container?
  - How many *gallons* of paint are in the container altogether?
12. An orchestra has 10 cellists.
- There are 3 violin players for every cellist in the orchestra. How many violin players are there?
  - There are 6 viola players for every 5 cellists in the orchestra. How many viola players are there?
  - What is the ratio of viola players to violin players? Give your answer in simplest form.
13. Give two possible pairs of values for  $p$  and  $q$ :  $\frac{2}{5} = \frac{p}{q}$ .

**5.4 Practice A**

Use multiplication to solve the proportion.

1.  $\frac{7}{4} = \frac{y}{28}$

2.  $\frac{d}{48} = \frac{3}{4}$

3.  $\frac{j}{8} = \frac{35}{56}$

Use the Cross Products Property to solve the proportion.

4.  $\frac{14}{21} = \frac{b}{9}$

5.  $\frac{10}{p} = \frac{6}{9}$

6.  $\frac{55}{4} = \frac{h}{6}$

7. Eighteen oranges are packaged in 3 containers. How many oranges are packaged in 7 containers?
8. It costs \$270 for 3 people to go on a fishing trip. How much does it cost for 10 people to go on the fishing trip?

Solve the proportion.

9.  $\frac{3x}{10} = \frac{9}{4}$

10.  $\frac{5x}{3} = \frac{80}{12}$

11.  $\frac{7}{2} = \frac{x+1}{6}$

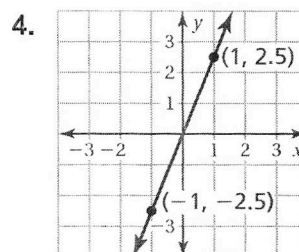
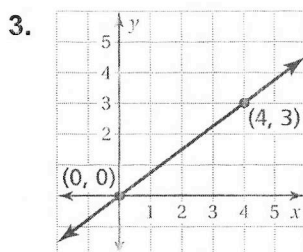
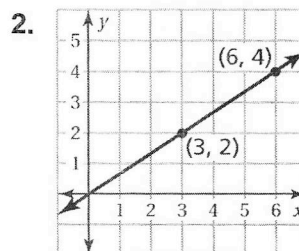
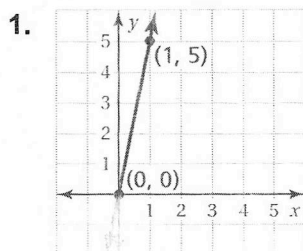
12. Tell whether the statement is
- true*
- or
- false*
- . Explain.

If  $\frac{p}{q} = \frac{3}{5}$ , then  $\frac{5}{p} = \frac{3}{q}$ .

13. The dimensions of a miniature model are proportional to the dimensions of the actual building.
- A wall that is 12 feet high on the building is 36 centimeters high on the model. Find the height on the model of a door that is 9 feet high on the building.
  - Use a different method than the one you used in part (a) to find the number of centimeters on the model for a window that is 3 feet wide.
14. The ratio of men to women at a lecture is 2 to 5. A total of 63 people are at the lecture. How many are men? Explain how you found your answer.
15. The distance traveled (in feet) is proportional to the number of seconds. Find the values of  $x$ ,  $y$ , and  $z$ .
- |                |   |     |     |     |
|----------------|---|-----|-----|-----|
| <b>Feet</b>    | 3 | $x$ | 15  | $z$ |
| <b>Seconds</b> | 5 | 65  | $y$ | 3.5 |
16. You train for a race by running at a speed of 6 miles per hour.
- At this speed, how many *minutes* does it take you to run 3.2 miles?
  - On race day, you run 3.2 miles in 30 minutes. What is your speed in miles per hour?

# 5.5 Practice A

Find the slope of the line.



Graph the data. Then find and interpret the slope of the line through the points.

5.

Days, $x$	2	4	6	8
Pages, $y$	80	160	240	320

6.

Seconds, $x$	10	20	30	40
Feet, $y$	22	44	66	88

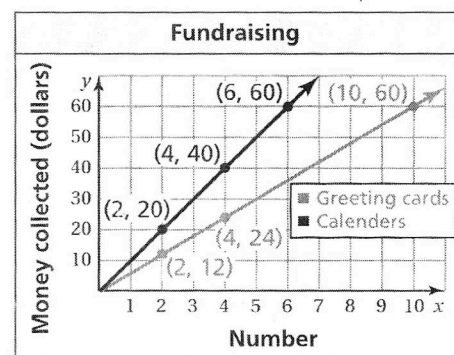
Graph the line that passes through the two points. Then find the slope of the line.

7.  $(0, 0), (4, 3)$

8.  $(-1, -2), (2, 4)$

9.  $(-4, -1), (8, 2)$

10. The graph shows the amounts that you are collecting for selling calendars and boxes of greeting cards to raise money for the school band.



- Compare the steepness of the lines. What does this mean in the context of the problem?
- Find the slope of each line. What does each slope mean in the context of the problem?
- How much more does it cost to buy 3 calendars than 4 boxes of greeting cards?
- Find two different ways that you could collect exactly \$36.

# 5.6 Practice A

Graph the ordered pairs in a coordinate plane. Do you think that graph shows that the quantities vary directly? Explain your reasoning.

1.  $(-2, -2), (0, 0), (2, 2), (4, 4)$

2.  $(-1, -4), (0, -1), (1, 2), (2, 5)$

Tell whether  $x$  and  $y$  show direct variation. Explain your reasoning. If so, find  $k$ .

3. 

$x$	-1	0	1	2
$y$	2	0	2	4

4. 

$x$	2	4	6	8
$y$	1	2	3	4

5.  $y - 2 = 3x - 2$

6.  $y + 3 = x$

7.  $xy = 5$

8. The table shows the grams of fiber  $y$  for the grams of protein  $x$ . Graph the data. Tell whether  $x$  and  $y$  show direct variation. If so, write an equation that represents the line.

Grams of protein, $x$	3	6	9	12
Grams of fiber, $y$	2	4	6	8

The variables  $x$  and  $y$  vary directly. Use the values to find the constant of proportionality and write an equation that relates  $x$  and  $y$ .

9.  $y = 6; x = 2$

10.  $y = 15; x = 3$

11.  $y = 40; x = 10$

12. To prepare an aquarium for use, you can clean it with a saltwater solution. The amount of salt varies directly with the volume of the water. The solution has 2 teaspoons of aquarium salt for every gallon of water.
- How many teaspoons of aquarium salt are needed for 5 gallons of water?
  - Write an equation that relates  $x$  gallons of water to  $y$  teaspoons of salt.
  - Use the equation to find the number of gallons of water to use for 12 teaspoons of salt.
13. The total cost of football tickets varies directly with the number of tickets purchased. Four tickets cost \$32. How many tickets can you buy for \$56?
14. One quart is equivalent to 0.95 liter.
- Write a direct variation equation that relates  $x$  quarts to  $y$  liters.
  - Write a direct variation equation that relates  $x$  gallons to  $y$  liters.
  - Write a direct variation equation that relates  $x$  liters to  $y$  quarts.
  - What is the relationship between the values of  $k$  in the direct variation equations in parts (a) and (c)?

**Chapter**  
**5**
**Take Home Quiz #1**

For use after Section 5.3

Write the ratio as a fraction in simplest form.

1. 24 messages : 10 messages

2. 5 meters to 20 meters

Use the ratio table to find the unit rate with the specified units.

3. miles per gallon

4. cost per box

<b>Gallons</b>	0	2	4	6
<b>Miles</b>	0	31	62	93

<b>Boxes</b>	3	6	9
<b>Cost</b>	\$3.60	\$7.20	\$10.80

Tell whether the ratios form a proportion.

5.  $\frac{4}{7}, \frac{24}{35}$

6.  $\frac{11}{12}, \frac{33}{36}$

Tell whether the two rates form a proportion.

7. 25 cars in 5 days; 60 cars in 12 days

8. 14 books in 2 boxes; 20 books in 3 boxes

Use the table to write a proportion.

9.

	<b>Cashews</b>	<b>Peanuts</b>
<b>Dollars</b>	12	16
<b>Pounds</b>	3	$p$

10.

	<b>Monday</b>	<b>Tuesday</b>
<b>Emails</b>	$e$	30
<b>Hours</b>	8	10

Solve the proportion.

11.  $\frac{x}{10} = \frac{4}{5}$

12.  $\frac{8}{9} = \frac{p}{81}$

13. The number of pictures your printer can print are shown in the table. Find the rate in pictures per minute.

<b>Minutes</b>	2	4	6	8
<b>Pictures</b>	16	32	48	64

14. On Monday, you swim 12 laps in 30 minutes. On Tuesday, you swim 15 laps in 45 minutes. Are these rates proportional? Explain.

15. A chemical compound requires 8 ounces of Chemical A and 12 ounces of Chemical B. A mixture contains 24 ounces of Chemical A and 30 ounces of Chemical B. How can you fix the mixture to make the chemical compound?

16. In an animal shelter, the ratio of dogs to cats is 5 to 3. There are 25 dogs. Write and solve a proportion to find the number  $c$  of cats.

**Answers**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

# Chapter 5 Take Home Quiz #2

For use after Section 5.6

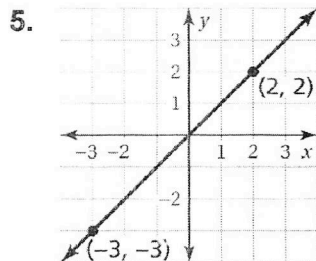
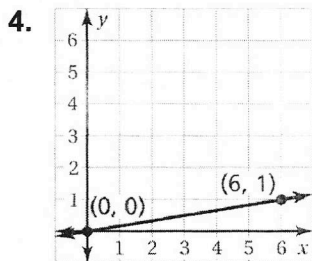
Solve the proportion.

1.  $\frac{7}{3} = \frac{b}{18}$

2.  $\frac{10}{9} = \frac{5}{k}$

3.  $\frac{3.6}{m} = \frac{1.2}{3.6}$

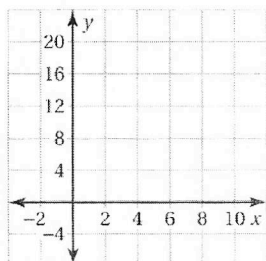
Find the slope of the line.



Graph the data. Then find and interpret the slope of the line through the points.

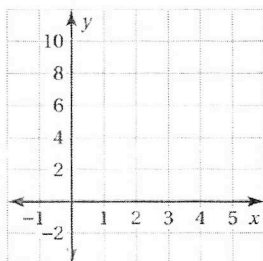
6.

Day, $x$	0	2	4	6
Inches, $y$	0	8	16	24



7.

Pounds, $x$	3	4	5	6
Cost, $y$	6	8	10	12



Tell whether  $x$  and  $y$  show direct variation. Explain your reasoning.

8.  $xy = 5$

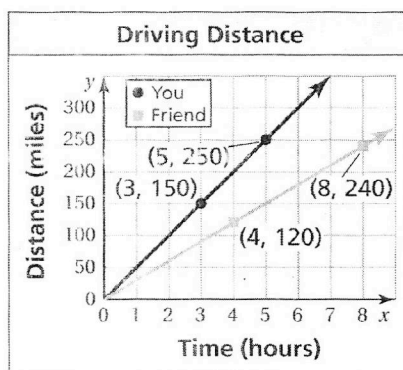
9.  $2x = 3y$

10. There are 25 students in a classroom. The ratio of girls to boys is 3 to 2. How many boys and how many girls are there in the classroom?

11. The graph shows the distance you and your friend drive on a trip.

a. Find and interpret the slope of each line.

b. How much faster are you traveling than your friend?



Answers

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. See left.

7. See left.

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. a. \_\_\_\_\_

b. \_\_\_\_\_