6–4 Algebra: Solving Proportions

MAIN IDEA
- Solve proportions.

EXAMPLES Solve Using Equivalent Fractions

Solve each proportion.

1 $\frac{4}{5} = \frac{28}{x}$

Find a value for x so the fractions are equivalent.

$$\frac{4}{5} \overset{\times 7}{=} \frac{28}{x} \quad \times 7$$

Since $4 \times 7 = 28$, multiply the numerator and denominator by 7.

$$\frac{4}{5} = \square$$

Since $5 \times 7 = 35$, $x = \square$.

2 $\frac{b}{5} = \frac{16}{20}$

$$\frac{b}{5} \overset{\times 4}{=} \frac{16}{20} \quad \times 4$$

Since $5 \times 4 = 20$, multiply the numerator and denominator by 4.

$$\square = \frac{16}{20}$$

Since $4 \times 4 = 16$, $b = \square$.

3 $\frac{19}{38} = \frac{n}{22}$

$$\div 2 \left(\frac{19}{38} = \frac{n}{22}\right) \div 2$$

Since $38 \div 2 = 19$, divide each denominator by 2.

$$\frac{19}{38} = \square$$

THINK What is 22 divided by 2?

So, $n = \square$.

Check Your Progress **Solve each proportion.**

a. $\frac{3}{8} = \frac{9}{x}$ $\square$

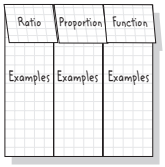
b. $\frac{18}{24} = \frac{m}{4}$ $\square$

c. $\frac{12}{48} = \frac{f}{28}$ $\square$

FOLDABLES

ORGANIZE IT

Write the definition of *proportion* in your own words under the Proportion tab in your Foldable. then write a few examples and show how to find their solutions.



EXAMPLE **Make Predictions in Proportional Situations**

4 **SPORTS** **Out of the 40 students in a gym class, 12 rate soccer as their favorite sport. Based on this result, predict how many of the 4,200 students in the community would rate soccer as their favorite sport.**

Write and solve a proportion. Let s represent the number of students who can be expected to rate soccer as their favorite sport.

Class **Community**

soccer as favorite sport → $\frac{\square}{40} = \frac{s}{\square}$ ← soccer as favorite sport

total students → 40 ← total students

$$\frac{12}{40} = \frac{s}{4{,}200}$$

Since $40 \times 105 = 4{,}200$, multiply the numerator and denominator by 105.

$$\frac{12}{40} = \square$$

Of the students in the community, about ☐ can be expected to rate soccer as their favorite sport.

Check Your Progress **BUSINESS** Out of 50 people in one department of a large corporation, 35 stated that they enjoy their job. Based on this result, how many of the 2,400 employees of this corporation can be expected to say that they enjoy their job?

EXAMPLE Solve Using Unit Rates

5 **WAGES** **Cedric earned $184 for 8 hours of work. At this rate, how much will he earn for 15 hours of work?**

Step 1 Set up the proportion. Let d represent the dollar amount Cedric will earn for 15 hours of work.

$$\boxed{} = \boxed{}$$

Step 2 Find the unit rate.

$$\frac{\$184}{8 \text{ hours}} \overset{\div 8}{\underset{\div 8}{=}} \boxed{}$$

Find an equivalent fraction with a denominator of 1.

Step 3 Rewrite the proportion using the unit rate and solve using equivalent fractions.

$$\frac{\$184}{8 \text{ hours}} \overset{\div 8}{\underset{\div 8}{=}} \boxed{} \overset{\times 15}{\underset{\times 15}{=}} \boxed{}$$

So, the value of d is $\boxed{}$. At the given rate, Cedric will earn $\boxed{}$ for 15 hours of work.

Check Your Progress **DOGS** Marci walked 24 dogs in 6 days. At this rate, how many dogs will she walk in 14 days?

HOMEWORK ASSIGNMENT

Page(s):

Exercises: