

## Lesson 6-1

### Example 1 Write Ratios as Fractions

Express the ratio *8 golden retrievers out of 20 dogs* as a fraction in simplest form.

$$\div 4$$

$$\frac{8}{20} = \frac{2}{5} \quad \text{Divide the numerator and denominator by the GCF, 4.}$$

$$\div 4$$

The ratio of golden retrievers to dogs is 2 to 5. This means that for every 5 dogs, 2 of them are golden retrievers.

### Example 2 Write Ratios as Fractions

Express the ratio *2 yards to 4 feet* as a fraction in simplest form.

$$\begin{aligned} \frac{2 \text{ yards}}{4 \text{ feet}} &= \frac{6 \text{ feet}}{4 \text{ feet}} && \text{Convert 2 yards to feet.} \\ &= \frac{3 \cancel{\text{ feet}}}{2 \cancel{\text{ feet}}} && \text{Divide the numerator and denominator by the GCF, 2.} \end{aligned}$$

Written in simplest form, the ratio 3 to 2.

### Example 3 Find Unit Rate

**SHOPPING** A 20-ounce box of cereal is priced at \$3.80, and a 36-ounce box of the same cereal is priced at \$6.45. Which box has the lower cost per ounce of cereal?

Find and compare the unit rates of the packages.

$$\div 20$$

$$\frac{3.80 \text{ dollars}}{20 \text{ ounces}} = \frac{0.19 \text{ dollars}}{1 \text{ ounce}} \quad \text{Divide the numerator and denominator by 20 to get a denominator of 1.}$$

$$\div 20$$

For the 20-ounce box, the unit rate is \$0.19 per ounce.

$$\div 36$$

$$\frac{6.45 \text{ dollars}}{36 \text{ ounces}} \approx \frac{0.179 \text{ dollars}}{1 \text{ ounce}} \quad \text{Divide the numerator and denominator by 36 to get a denominator of 1.}$$

$$\div 36$$

For the 36-ounce box, the unit rate is about \$0.179 per ounce.

So, the 36 ounce box has a lower cost per ounce.

**Example 4 Convert Rates****TRAVEL** A car travels at a rate of 60 miles per hour. How many feet is this per second?

You need to convert  $\frac{60 \text{ mi}}{1 \text{ h}}$  to  $\frac{? \text{ ft}}{1 \text{ s}}$ . There are 5280 feet in 1 mile and 3600 seconds in 1 hour. Write 60 miles per hour as  $\frac{60 \text{ mi}}{1 \text{ h}}$ .

$$\frac{60 \text{ mi}}{1 \text{ h}} = \frac{60 \text{ mi}}{1 \text{ h}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \div \frac{3600 \text{ s}}{1 \text{ h}}$$

Convert miles to feet and hours to seconds.

$$= \frac{60 \text{ mi}}{1 \text{ h}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{1 \text{ h}}{3600 \text{ s}}$$

The reciprocal of  $\frac{3600 \text{ s}}{1 \text{ h}}$  is  $\frac{1 \text{ h}}{3600 \text{ s}}$ .

$$= \frac{\overset{1}{\cancel{60}} \text{ mi}}{1 \cancel{\text{h}}} \times \frac{\overset{88}{\cancel{5280}} \text{ ft}}{1 \cancel{\text{mi}}} \times \frac{1 \cancel{\text{h}}}{\underset{1}{\cancel{3600}} \text{ s}}$$

Divide the common factors and units.

$$= \frac{88 \text{ ft}}{\text{s}}$$

Simplify.

So, 60 miles per hour is equivalent to 88 feet per second.