

Practice with Examples

For use with pages 180–185

GOAL Use rates, ratios, and percents to model and solve real-life problems**VOCABULARY**

If a and b are two quantities measured in different units, then the **rate of a per b** is $\frac{a}{b}$.

A **unit rate** is a rate per one given unit.

EXAMPLE 1 *Finding a Unit Rate*

While visiting Italy you want to exchange \$120 for liras. The rate of currency exchange is 1850 liras per United States dollar. How many liras will you receive?

SOLUTION

You can use unit analysis to write an equation.

$$\text{dollars} \cdot \frac{\text{liras}}{\text{dollars}} = \text{liras}$$

$$D \cdot \frac{1850}{1} = L \quad \text{Write equation.}$$

$$120 \cdot \frac{1850}{1} = L \quad \text{Substitute 120 for } D \text{ dollars.}$$

$$222,000 = L \quad \text{Simplify.}$$

You will receive 222,000 liras.

Exercises for Example 1

Convert the currency using the given exchange rate.

- Convert \$150 U.S. dollars to German marks. (\$1 U.S. is 1.8943 marks)
- Convert \$200 U.S. dollars to Austrian schillings. (\$1 U.S. is 13.3272 schillings)

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EXAMPLE 2 Using Ratios to Write an Equation

You took a survey of your classmates and found that 9 of the 27 classmates have public library cards. Use your results to make a prediction for the 855 students enrolled in your school.

SOLUTION

You can answer the question by writing a ratio. Let n represent the number of students in your school that have public library cards.

$$\frac{\text{Library cards in sample}}{\text{Total students in sample}} = \frac{\text{Library cards in school}}{\text{Total students in school}}$$

$$\frac{9}{27} = \frac{n}{855}$$

Write equation.

$$855 \cdot \frac{9}{27} = n$$

Multiply each side by 855.

$$285 = n$$

Simplify.

Of the 855 students enrolled in the school, about 285 will have a public library card.

Exercises for Example 2

3. Rework Example 2 if 6 of the 27 classmates have public library cards.

4. Rework Example 2 if 930 students are enrolled in the school.

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EXAMPLE 3 *Finding Percents*

What percent was the waiter's tip if he received \$3.60 for a \$20.00 meal?

SOLUTION

To find the percent, divide the amount of the tip by the price of the meal.

$$\frac{3.60}{20.00} = 0.18, \text{ so the tip was } 18\% \text{ of the price of the meal.}$$

Exercises for Example 3

Find the percent. Round to the nearest whole percent.

5. Tax of \$2.88 on an item priced at \$36

6. \$3 tip on a meal priced at \$16