Section Overview

Professional Development

Rates, Ratios, and Proportions — Lessons 2-6, 2-7

Why? You can use ratios to compare quantities or describe rates. Proportions are used in many fields, including construction, photography, and medicine.

A **ratio** is a comparison of two numbers by division.

$a:b \quad \frac{a}{b} \quad (b \neq 0)$

A **proportion** states that two ratios are equivalent.

$\frac{a}{b} = \frac{c}{d} \quad (b \neq 0, d \neq 0)$

In a proportion, **cross products** are equal.

If $\frac{a}{b} = \frac{c}{d}$ $(b \neq 0, d \neq 0)$,

then $ad = bc$.

Percents — Lesson 2-8

Why? Using percents is a way of comparing numbers. Percents are common in daily life. For example, many statistics are reported as percents.

Find 20% of 90.

$$\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$$
$$\frac{20}{100} = \frac{x}{90}$$
$$100x = 1800$$
$$x = 18$$

20% of 90 is 18.

What percent of 60 is 12?

$$\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$$
$$\frac{x}{100} = \frac{12}{60}$$
$$60x = 1200$$
$$x = 20$$

12 is 20% of 60.

40% of what number is 26?

$$\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$$
$$\frac{40}{100} = \frac{26}{x}$$
$$40x = 2600$$
$$x = 65$$

40% of 65 is 26.

Applications of Percents — Lessons 2-9, 2-10

Why? Percents have many common uses, such as calculating discounts, tips, sales tax, markups, and interest.

Annual Simple Interest Formula

$I = Prt$

Simple interest — Time in years — Principal — Interest rate per year as a decimal

After 6 months, the simple interest earned on an investment of \$4000 was \$90. Find the interest rate.

$$I = Prt$$
$$90 = (4000)r\left(\frac{6}{12}\right)$$
$$90 = 2000r$$
$$0.045 = r$$

The interest rate is 4.5%.

Percent Change

$$\text{percent change} = \frac{\text{amount of increase or decrease}}{\text{original amount}}$$

Find the percent change from 50 to 35.

amount of decrease $= 50 - 35 = 15$

original amount $= 50$

$$\text{percent decrease} = \frac{15}{50} = \frac{3}{10} = 30\%$$

From 50 to 35 is a 30% decrease.