TEXAS TAKS Obj. 9
TEKS 8.3.B

REVIEWING PERCENT, PROPORTION, AND RATE PROBLEMS

Many real-life problems involve working with percents, proportions, and rates. To solve such problems, you need to understand the following definitions.

Ratios, Percents, Proportions, and Rates

Ratios The definitions of percent, proportion, and rate are all based on the concept of a *ratio*. A ratio compares two numbers using division. The ratio of a number *a* to a nonzero number *b* can be written as "*a* to *b*," $a:b$, or $\frac{a}{b}$.

Percents A *percent* is a ratio that compares a number to 100.

Proportions A *proportion* is an equation that states that two ratios are equivalent.

Rates A *rate* is a ratio of two quantities measured in different units. A *unit rate* has a denominator of 1 when expressed as a fraction. When expressed in words, a unit rate often contains the word *per*, which means "for every."

EXAMPLE

Caleb buys a DVD player priced at $160. The total cost of the DVD player, including sales tax, is $173.20. What is the sales tax percent to the nearest hundredth of a percent?

Solution

STEP 1 **Write** a verbal model for the situation. Then write an equation.

Total cost (dollars)	=	DVD player price (dollars)	+	Sales tax (as a decimal)	·	DVD player price (dollars)
173.20	=	160	+	r	·	160

STEP 2 **Solve** the equation $173.20 = 160 + 160r$.

$$173.20 = 160 + 160r \qquad \textbf{Write equation.}$$
$$13.2 = 160r \qquad \textbf{Subtract 160 from each side.}$$
$$0.0825 = r \qquad \textbf{Divide each side by 160.}$$

▶ The sales tax is 8.25%.