7.4 The Percent Equation

Goal: Use equations to solve percent problems.

The Percent Equation

You can represent "a is p percent of b" using the equation

$a = p\% \cdot b$

where a is a part of the base b and $p\%$ is the percent.

Example 1 *Finding a Part of a Base*

In a newspaper's survey, 1100 adults were asked to name their favorite condiment. The most frequent response was ketchup, which was given by 47% of the adults. How many adults chose ketchup?

$0.47 \cdot 1100 = 517$ adults

Solution

To find how many adults chose ketchup as their favorite condiment, use the percent equation.

$a = p\% \cdot b$	Write percent equation.
$= \square \cdot \square$	Substitute for p and for b.
$= \square \cdot \square$	Write percent as a decimal.
$= \square$	Multiply.

Answer: The number of adults who chose ketchup as their favorite condiment was $\square$.

Checkpoint **Use the percent equation to answer the question.**

1. What number is 15% of 60?

$N = 0.15 \cdot 60$

$N = 9$

2. What number is 78% of 105?

$n = 0.78 \cdot 105$

$n = 81.9$

Example 2 *Finding a Commission*

Commission A sales person earns 5.5% commission on every car sold. The sales person sells a house for $41,200. What is the commission?

Solution

$a = p\% \cdot b$	Write percent equation.
$= 5.5\% \cdot 41{,}200$	Substitute for p and for b.
$= 0.055 \cdot 41{,}200$	Write percent as decimal.
$= \$2{,}266$	Multiply.

Answer: The commission is $2,266

Checkpoint

3. In Example 2, find the commission if a car is sold for $45,000.

$5.5\% \cdot 45{,}000$

$0.055 \cdot 45{,}000$

$2,475

Example 3 *Finding a Percent*

What percent of 24 is 84?

$a = p\% \cdot b$	Write percent equation.
$\square = p\% \cdot \square$	Substitute for a and for b.
$\square = p\%$	Divide each side by $\square$.
$\square = p\%$	Write decimal as a percent.

Answer: 84 is 350% of 24.

percent of 24 is 84

$\frac{P \cdot 24}{24} = \frac{84}{24}$

$P = 3.50$

350%

Checkpoint Use the percent equation to answer the question.

4. What percent of 15 is 21?

$\frac{P \cdot 15}{15} = \frac{21}{15}$

$P = 1.4$

140%

5. What percent of 72 is 45?

$\frac{P \cdot 72}{72} = \frac{45}{72}$

$P = 0.625$

62.5%

Example 4 *Finding a Base*

Football Your friend paid $48 for a ticket to a professional football game. This amount was 64% of the total amount your friend spent at the game. How much money did your friend spend?

64% of total = 48

$\frac{0.64 \cdot m}{0.64} = \frac{48}{0.64}$

$m = 75$

Solution

$a = p\% \cdot b$		Write percent equation.
$\square = \square\% \cdot b$		Substitute for a and for p.
$\square = \square \cdot b$		Write percent as decimal.
$\square = b$		Divide each side by $\square$.

Answer: Your friend spent $\$\square$ at the game.

Checkpoint Use the percent equation to answer the question.

6. 33 is 30% of what number?

$\frac{33}{0.3} = \frac{0.3 \cdot n}{0.3}$

110 = n

7. 90 is 37.5% of what number?

$\frac{90}{0.375} = \frac{0.375 \cdot n}{0.375}$

240 = n