Solving Percent Problems

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

$\frac{a}{b} = \frac{p}{100}$

where *a* is a part of the base *b* and *p*%, or $\frac{p}{100}$, is the percent.

Example 1 *Finding a Percent*

What percent of 9 is 5?

% of 9 is 5

$\frac{a}{b} = \frac{p}{100}$ Write proportion.

$\square = \frac{p}{100}$ Substitute for *a* and for *b*.

$\square \cdot \frac{5}{9} = \square \cdot \frac{p}{100}$ Multiply each side by $\square$.

$\square = p$ Simplify.

$P \cdot \frac{9}{9} = \frac{5}{9}$

$P = 0.5555$

$P = 56\%$

Answer: 5 is $\square$% of 9.

is → equals

of → multiply

Checkpoint Use a proportion to answer the question.

1. What percent of 28 is 4?

$P \cdot \frac{28}{28} = \frac{4}{28}$

$P = 0.1428$

14%

2. What percent of 80 is 30?

$P \cdot \frac{80}{80} = \frac{30}{80}$

$P = 0.375$

38%

37.5%

What number is 15% of 300?

number is 15% of 300
n = 0.15 • 300

$\frac{a}{b} = \frac{p}{100}$ Write proportion.

$\frac{a}{\square} = \frac{\square}{100}$ Substitute for b and for p.

n = 45

$\square \cdot \frac{a}{\square} = \square \cdot \frac{\square}{100}$ Multiply each side by $\square$.

$a = \square$ Simplify.

Answer: $\square$ is 15% of 300.

Example 3 *Finding a Base*

Student Council Election You receive 189 votes, or 45%, of the votes in the student council election. How many students voted?

Solution

189 is a part of the total number of voters, which is the base.

45% of total votes = 189
0.45 • V = 189
V = 189 / 0.45
V = 420 people

$\frac{a}{b} = \frac{p}{100}$ Write proportion.

$\frac{\square}{b} = \frac{\square}{100}$ Substitute for a and for p.

$\square \cdot \square = \square \cdot \square$ Cross products property

$\square = \square$ Multiply.

$\square = b$ Divide each side by $\square$.

Answer: $\square$ students voted in the election.

Checkpoint **Use a proportion to answer the question.**

3. What number is 62% of 200?	**4.** 117 is 78% of what number?