

## Solving Percent Problems

There are three types of percent problems that you are going to have to solve: finding the part, whole, and percent. There are two ways to do this, so pick the one you understand the best.

Way #1: The Proportion Method.

In this method, we write a proportion like so:  $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$ . The percent is always over 100 because that's what percent means. The "part over whole" is the definition of a fraction. In this case, the number following "of" is the whole.

The advantage to the proportion method is that we never have to worry about moving decimal points in our percents. The division by 100 takes care of that for us.

Way #2: The Percent Equation Method.

This method is a word-for-word translation method. In this case, "of" means "multiply" and "is" means "equals". The advantage is that it's sometimes easier; the disadvantage is that there's decimal moving involved with the percents.

A) Finding the part. Find 15% of 80.

Way #1: The number following "of" is 80, so that's the whole. The percent is 15, so we're trying to find the part:  $\frac{15}{100} = \frac{x}{80}$ . Now cross multiply and find "x".

Way #2: We're looking for 15% of 80, so the translation is like so:

$$\begin{array}{c} \downarrow \quad \downarrow \quad \downarrow \\ 0.15 \bullet 80 = x \end{array}$$

**Example:** Find 52% of 95.

B) Finding the whole:      25 is 40% of what number?

Way #1: There is no number following “of”; that’s what we’re trying to find, so that will be our variable this time. That means 25 is the part, and, of course, 40 is the

percent:                       $\frac{40}{100} = \frac{25}{x}$ .                      Cross multiply and find “x”.

Way #2:                      “25 is 40% of what number” translates as such:

↓ ↓ ↓ ↓      ↓  
25 = 0.40 •      x

Again, we have to move the decimal point.

Like with proportions, we divide by 0.40 on both sides to solve for “x”.

**Example:** 30 is 75% of what number?

C) Finding the percent: 9 is what percent of 15?

Way #1: The whole is 15, we're trying to find the percent, and so the part is 9.

$$\frac{x}{100} = \frac{9}{15}$$

Remember, we don't have to move the decimal point!

Way #2: "9 is what percent of 15" translates like so:

$$\begin{array}{ccc} \downarrow \downarrow & \downarrow & \downarrow \downarrow \\ 9 = & x & \bullet 15 \end{array}$$

Again, divide by 15.  
This time we must move the decimal point in the answer because it's the decimal equivalent of a percent.

**Example:** 14 is what percent of 35?

1) Find 7% of \$25.99

2) 3 is 20% of what number?

3) What percent of 60 is 28?

4) 0.8% of 3500 is what number?