Percent Equations

There are many ways to solve problems involving percents. All of them require that you identify three parts of the problem (percent, base and amount), but most of require that you also learn rules for when you multiply and when you divide. This is fairly confusing.

The best way to solve the basic percent problem is to use the proportion, $\frac{percent}{100} = \frac{amount}{base}$ and the cross multiplication, *percent * base= 100 * amount.*

4% of 85,000 is what number?

First, we must determine where the above numbers go in the proportion. As a general rule, you can look at the ratio $\frac{amount}{base}$ by looking at the wording of the problem. The number associated with the word **of** generally as the base and the number associated with the word **is** generally is the amount. So, $\frac{amount}{base} = \frac{is}{of}$.

4 = percent
is = what number (the variable (n))
of = 85,000

$\frac{4}{100} = \frac{n}{85{,}000}$, by cross multiplying we get

$4(85{,}000) = 100n$
$340000 = 100n$
$3400 = n$

What percent of 40 is 30?

Is = 30
Of = 40
Percent = what (n)

$\frac{n}{100} = \frac{30}{40}$

$40n = 3000$
$n = 75\%$

18% of what is 900?

Percent = 18
Is = 900
Of = what (n)

$\frac{18}{100} = \frac{900}{n}$

$18n = 90000$
$n = 5000$

Applications of Percents

A certain charitable organization spent $2940 for administrative costs. This is 12% of the total amount of the monies they collected. How much did they collect in total?

We are really asking $2940 is 12% of what number?

$$\frac{12}{100} = \frac{2940}{n}$$

$12n = 294000$

n =24,500 so, they collected a total of $24,500

The fire department reports that 24 false alarms were sent in out of a total of 200 alarms. What percent of all the alarms are false?

We are really asking 24 is what percent f 200?

$$\frac{n}{100} = \frac{24}{200}$$

$200n = 2400$

n = 12% so, 12% were false alarms

An antiques dealer claims that 86% of her sales are for items that cost less than $1000. If she sells 250 items in a given month, how many will sell for less than $1000?

We are really asking what number is 86% of 250? (notice $1000 is not used anywhere)

$$\frac{86}{100} = \frac{n}{250}$$

$100n = 21500$

n = 215 so, 215 sold for less than $1000