The Basic Percent Equation

The basic percent equation can be used to solve percent problems. The basic percent equation has three parts; the percent, the base and the amount.

BASIC PERCENT EQUATION

Percent × Base = Amount

P × B = A

P, B and A are variables. You must know 2 of the 3 to solve the equation.
To solve a percent problem you must be able to identify the different parts of the equation.

1. Look for the percent first. It will either be given or it will say "what percent", which will tell you that the percent is the part that is missing.

2. Find the base next. The base always follows "percent of". This might be in words or it might be "% of", using the symbol for percent.

3. Any remaining number must be the amount. It will often be next to the word "is", which translates to the equal sign.

EXAMPLE: What is 35% of 200?

1. The percent is given. (35%) 2.
   After "% of" comes the base. (200)
3. The amount is missing.

P × B = A
35% × 200 = A

In order to work with the percent we must convert it to an equivalent decimal or fraction. A decimal is usually easier unless the percent gives a repeating decimal.

35% = 35(0.01) = 0.35

SOLVE: P × B = A
0.35 × 200 = A
70 = A
35% of 200 = 70

EXAMPLE: Find 33⅓% of 96.

1. The percent is given. (33⅓%) 2.
   After "% of" comes the base (96).
3. The amount is missing.

P × B = A

$33\frac{1}{3}\% \times 96 = A$

In this problem you will want to change $33\frac{1}{3}\%$ to a fraction to avoid a repeating decimal.

$$33\frac{1}{3}\% = 33\frac{1}{3} \times \frac{1}{100}$$

$$= \frac{100}{3} \times \frac{1}{100}$$

$$= \frac{1}{3}$$

SOLVE: $P \times B = A$

$$\frac{1}{3} \times 96 = A$$

$$\frac{1}{3}(96) = A$$

$$32 = A\frac{1}{3}$$

of 96 is 32

EXAMPLE: 30% of what is 240?

1. The percent is given. (30%)
2. After "% of" is the word "what". The base is missing.
3. The amount must be 240.

$$P \times B = A$$

$$30\% \times B = 240$$

Change 30% to the equivalent decimal: 30(0.01) = 0.3

$$0.3 \times B = 240$$

$$0.3\,B = 240$$

$$\frac{0.3}{0.3}B = \frac{240}{0.3}$$

$$B = 800$$

$$0.3\overline{)240} = 3\overline{)2400}\ 800$$

30% of 800 is 240

EXAMPLE: What percent of 45 is 9?

1. The percent is missing.
2. After "percent of" comes the base (45).
3. The amount must be 9.

$$P \times B = A$$
$$P \times 45 = 9$$
$$45P = 9$$
$$\frac{45}{45}P = \frac{9}{45}$$
$$P = \frac{1}{5}$$

The question asked for the percent so we must change $\frac{1}{5}$ to a percent.

$\frac{1}{5}(100\%) = \frac{1}{5} \times \frac{100}{1}\% = \frac{100}{5}\% = 20\%$ Therefore,

<u>20%</u> of 45 is 9.

<u>EXERCISES</u>:

1. What percent of 20 is 12?
2. What is 27% of 300?
3. 66⅔% of what number is 150?
4. Find 48% of 1600.
5. 50 is what percent of 800?
6. 12.5% of what number is 125.
7. What is 16⅔% of 120?
8. What percent of 140 is 490?

<u>KEY:</u>

1. P = 60%
2. A = 81
3. B = 225
4. A = 768
5. P = 6.25%
6. B = 1000
7. A = 20
8. P = 350%