

SOLVING PERCENT PROPORTIONS¹

Definition 1. *The Percent Proportion is defined by*

$$\frac{\text{amount}}{\text{base}} = \frac{\text{percent number}}{100}.$$

We use the letter p (a variable) to represent the percent number. The base, denoted by the letter b , is the entire quantity or total involved.

Note: *The number that is the base usually appears after the word of.*

The amount, denoted by the letter a , is the part being compared to the whole or total.

Therefore, the percent proportion can be written by

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

Example 1. *Solve using the percent proportion.*

Find 0.5% of 240.

Solution 1. *Remember the percent proportion is defined by*

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

Define $a = \text{unknown}$, $b = 240$, and $p = 5$. Then substituting the numbers into the percent proportion yields $\frac{a}{240} = \frac{5}{100}$. Solving this proportion yields $a = 12$.

Example 2. *Solve using the percent proportion.*

30% of 80 is what?

Solution 2. *Remember the percent proportion is defined by*

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

Define $a = \text{unknown}$, $b = 80$, and $p = 30$. Then substituting the numbers into the percent proportion yields $\frac{a}{80} = \frac{30}{100}$. Solving this proportion yields $a = 24$.

Example 3. Solve using the percent proportion.

2000 is 0.4% of what?

Solution 3. Remember the percent proportion is defined by

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

Define $a = 2000$, $b = \text{unknown}$, and $p = 4$. Then substituting the numbers into the percent proportion yields $\frac{2000}{b} = \frac{4}{100}$. Solving this proportion yields $b = 50,000$.

Example 4. Solve using the percent proportion.

30 is what percent of 400?

Solution 4. Remember the percent proportion is defined by

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

Define $a = 30$, $b = 400$, and $p = \text{unknown}$. Then substituting the numbers into the percent proportion yields $\frac{30}{400} = \frac{p}{100}$. Solving this proportion yields $p = 7.5$. Therefore, 7.5%.

Example 5. Solve using the percent proportion.

Find 120% of 45.

Solution 5. Remember the percent proportion is defined by

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

Define $a = \text{unknown}$, $b = 45$, and $p = 120$. Then substituting the numbers into the percent proportion yields $\frac{a}{45} = \frac{120}{100}$. Solving this proportion yields $a = 54$.

Example 6. *Solve using the percent proportion.*

What percent of 300 is 15?

Solution 6. *Remember the percent proportion is defined by*

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

Define $a = 15$, $b = 300$, and $p = \text{unknown}$. Then substituting the numbers into the percent proportion yields $\frac{15}{300} = \frac{p}{100}$. Solving this proportion yields $p = 5$. Therefore, 5%.

Example 7. *Solve using the percent proportion.*

125% of what is 80?

Solution 7. *Remember the percent proportion is defined by*

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

Define $a = 80$, $b = \text{unknown}$, and $p = 125$. Then substituting the numbers into the percent proportion yields $\frac{80}{b} = \frac{125}{100}$. Solving this proportion yields $b = 64$.