SOLVING PERCENT PROPORTIONS

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 \(b = 64\).