

Applications of Percents

In solving applications involving percents, we must be able to break the problem into the three parts of the Basic Percent Equation.

REMEMBER that the three parts of the Basic Percent Equation are the percent, the base and the amount.

$$P \times B = A$$

REMEMBER what to look for:

1. The percent will either be given or it will say "what percent" to indicate that the percent is missing.
2. The base usually follows "percent of" or "% of". In application problems this may not be a number, but a phrase which tells you where to go find the number.
3. Any remaining number will be the amount. It will often be with the word "is".

EXAMPLE: A company's budget for advertising is \$15,000. This is 5% of their total budget. What is their total budget?

1. The percent is given (5%).
2. After "% of" comes the phrase "their total budget". The base is the total budget and as this is what we are looking for, the base is missing.
3. The amount must be \$15,000.

$$\begin{array}{rcl} P & \times & B = A \\ 5\% & \times & B = 15,000 \end{array}$$

SOLVE: $0.05 \times B = 15,000$
 $0.05 B = 15,000$

$$\begin{array}{r} 0.05 \\ \hline 0.05 B = \frac{15,000}{0.05} \end{array}$$

$$B = 300,000$$

Their total budget is \$300,000. (Do not forget the units!)

CHECK: $5\% \text{ of } \underline{\$300,000} = \$15,000$

EXAMPLE: Five years ago a car was worth \$12,500. Today it is worth \$5,000. What percent of its value five years ago is its value now?

1. The percent is not given. We are asked to find the percent so it is missing.
2. After "percent of" comes "its value five years ago". The value five years ago (\$12,500) is the base.
3. The amount must be its value today (\$5,000).

$$\begin{aligned} P \times B &= A \\ P \times 12,500 &= 5,000 \end{aligned}$$

SOLVE: $12,500P = 5,000$

$$\frac{12,500}{12,500} P = \frac{5,000}{12,500}$$

$$P = 0.4$$

NOTE: Remember to convert the answer to a percent.

$$0.4 (100\%) = 40\%$$

The present value is 40% of the value 5 years ago.

EXAMPLE: 60% of Joe's investments are in stocks. If Joe's total investments are worth \$65,000, how much is invested in stocks?

1. The percent is given (60%).
2. After "% of" comes "Joe's investments." The base is Joe's investments (\$65,000).
3. There are no other numbers, so the amount is missing.

$$\begin{aligned} P \times B &= A \\ 60\% \times \$65,000 &= A \\ 0.6 \times 65,000 &= A \\ 39,000 &= A \end{aligned}$$

Joe has \$39,000 invested in stocks.

CHECK: $60\% \times \$65,000 = \$39,000$