SOLVING PROBLEMS INVOLVING PERCENTS

Percents can be solved via equation or via a proportion. Remember that the word "of" translates to multiplication and the word "is" translates to the equal sign. The base is the total or original amount and usually follows the word "of" and is the total or original amount.

To solve a percent problem using a proportion

1. Identify the percent, base, and amount.
2. Express the percent as a fraction with a denominator of 100:

$$\frac{P}{100} = \text{P\%}$$

3. Write the ratio:

$$\frac{amount}{base}$$

4. Equate the two ratios in a proportion and solve for the missing value.

Model Problem 1:

What is 56% of 180?

Solution:

The percent is 56%. Written as a fraction, we have $\frac{56}{100}$.

The base is 180 because it is the total amount. It also follows the word "of". The amount is the missing value.

$$\frac{56}{100} = \frac{n}{180}$$

$$100\ x\ n = 10{,}800$$

$$\frac{100\ x\ n}{100} = \frac{10{,}800}{100}$$

Thus, 56% of 180 is 100.8.

Model Problem 2:

2. 0.0002 is what percent of 0.00015?

Solution:

$$\frac{n}{100} = \frac{0.0002}{0.00015}$$

$$n\ x\ 0.00015 = 0.02$$

$$\frac{0.00015\,x\,n}{0.00015} = \frac{0.02}{0.00015}$$

$n = 133.\overline{33}$ so our answer is $133\frac{1}{3}\%$.

Model Problem 3:

15% of what number is 30?

Solution:

$$\frac{15}{100} = \frac{30}{x}$$

$$15x = 3{,}000$$

$$x = 200$$

Practice Exercises:

1. 12 is what percent of 50?
2. What percent of 50 is 125?
3. Find 18% of 40.
4. What is 25% of 60?
5. 12% of what is 48?
6. 45% of what is 9?
7. What is 60% of 5?
8. What percent of 8 is 6?
9. A student answered 70 of the 80 questions on a test correctly. What percent of the questions were answered correctly?
10. If 68% of students in a class of 300 passed a test, how many students passed this test?

Answers:

1. 24%
2. 250%
3. 7.2
4. 15
5. 400
6. 20
7. 3
8. 75%
9. 87.5%
10. 204 students