Chapter 5 Section 8

Percent Problems: Proportion Method

To solve percent problems using proportions

Problems that can be solved using the basic percent equation can also be solved using proportions.

The proportion method is based on writing two ratios. One ratio is the percent ratio, written as $\frac{percent}{100}$. The second ratio is the amount-to-base ratio, written as $\frac{amount}{base}$. These two ratios form the proportion:

$$\frac{percent}{100} = \frac{amount}{base}$$

To use the proportion method, first identify the percent, the amount, and the Base (the base usually follows the phrase "percent of").

Example 1: What is 23 % of 45?

$$\frac{23}{100} = \frac{n}{45}$$

$$23(45) = 100n$$

$$1035 = 100n$$

$$\frac{1035}{100} = \frac{100n}{100}$$

$$10.35 = n$$

Example 2: What percent of 25 is 4?

$$\frac{n}{100} = \frac{4}{25}$$

$$25n = 100(4)$$

$$25n = 400$$

$$\frac{25n}{25} = \frac{400}{25} = n = 16\%$$

Example 3: 12 is 60% of what number?

$$\frac{60}{100} = \frac{12}{n}$$

$$60n = 100\ (12)$$

$$60n = 1200$$

$$\frac{60n}{60} = \frac{1200}{60}$$

$$n = 20$$

To solve application problems

Example 4:
An antiques dealer found that 86 % of the 250 items that were sold for under $1000. How many items sold
for under $1,000?

Strategy
To find the number of items that sold for under $1000, write and solve a proportion, using *n* to represent the number of items sold (amount) for less than $1000. The percent is 86% and the base is 250.

Solution

$$\frac{86}{100} = \frac{n}{250}$$

$$86(250) = 100n$$

$$21{,}500 = 100n$$

$$\frac{21{,}500}{100} = \frac{100n}{100}$$

$$215 = n$$

215 items sold for under $1,000.