Example 2 A poster is 1 m long and 52 cm wide. Find the ratio of the width to the length.

Solution *Method 1*

Use centimeters.

1 m = 100 cm

$$\frac{\text{width}}{\text{length}} = \frac{52}{100} = \frac{13}{25}$$

Method 2

Use meters.

52 cm = 0.52 m

$$\frac{\text{width}}{\text{length}} = \frac{0.52}{1} = \frac{52}{100} = \frac{13}{25}$$

Example 2 shows that the ratio of two quantities is not affected by the unit chosen.

Sometimes the ratio of a to b is written in the form $a:b$. This form can also be used to compare three or more numbers. The statement that three numbers are in the ratio $c:d:e$ (read "c to d to e") means:

(1) The ratio of the first two numbers is $c:d$.
(2) The ratio of the last two numbers is $d:e$.
(3) The ratio of the first and last numbers is $c:e$.

Example 3 The measures of the three angles of a triangle are in the ratio 2:2:5. Find the measure of each angle.

Solution Let $2x$, $2x$, and $5x$ represent the measures.

$$2x + 2x + 5x = 180$$
$$9x = 180$$
$$x = 20$$

Then $2x = 40$ and $5x = 100$.

The measures of the angles are 40, 40, and 100.

A **proportion** is an equation stating that two ratios are equal. For example,

$$\frac{a}{b} = \frac{c}{d} \quad \text{and} \quad a:b = c:d$$

are equivalent forms of the same proportion. Either form can be read "a is to b as c is to d." The number a is called the first *term* of the proportion. The numbers b, c, and d are the second, third, and fourth terms, respectively.

When three or more ratios are equal, you can write an *extended proportion:*

$$\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$$