



**Math Lesson 3**  
**Fractions, Decimals II (Grades 4-6)**

**Instruction 3-4**  
**Use Proportions to Solve Problems**

A **proportion** is an equation stating that two ratios are equivalent.  
A **cross product** of two fractions is a product of the numerator of one fraction and the denominator of the other fraction.

If two ratios form a proportion, the cross products are equal.  
For example, if

$$\frac{4}{6} = \frac{y}{9}, \text{ then } 4 \times 9 = y \times 6.$$

Also, if their cross products are equal, the two ratios form a proportion.  
For example, if

$$\frac{6}{8} = \frac{9}{12} \text{ is a proportion, since } 6 \times 12 = 8 \times 9; \text{ both are equal to } 72.$$

To find out if the proportions are equal you need to find the cross product.

The ratios are  $\frac{25}{5}$  and  $\frac{40}{10}$ .

The cross products are  $20 \times 10$  and  $40 \times 5$

Compare the cross products.

$$20 \times 10 = 200 \\ 40 \times 5 = 200$$

The cross products are equal.

$$\frac{20}{5} = \frac{20 \times 10}{5 \times 10}$$

The two ratios are equivalent.

$$\frac{40}{10} = \frac{40 \times 5}{10 \times 5} \\ \frac{20}{5} = \frac{40}{10}$$

To find fractions proportional to the original solve for the variable given.

Write and solve the proportion.

$$\frac{11}{n} = \frac{4}{8}$$

Cross multiply  
Solve for n by dividing each side by 4.

$$88 = 4n \\ \frac{88}{4} = \frac{4n}{4}$$

Answer

$$n = 22 ; \frac{11}{22} = \frac{4}{8}$$



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Not all proportions are whole numbers.

Write and solve the proportion.

$$\frac{60}{8} = \frac{x}{7}$$

Cross multiply

$$420 = 8x$$

Solve for x by dividing each side by 8.

$$\frac{420}{8} = \frac{8x}{8}$$

Answer

$$n = 52.5 ; \frac{60}{8} = \frac{52.5}{7}$$