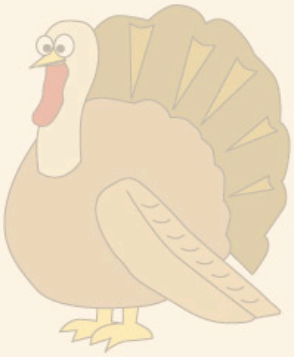
7th Grade
Lesson 39

- I can use cross products to determine if two ratios are equal.
- I can solve a proportion for a missing term.



A **proportion** is a statement that two ratios are equal.

$\frac{16}{20} = \frac{n}{5}$

$\frac{16}{20} = \frac{4}{5}$

The **cross products** of equal ratios are equal.

$16 \cdot 5 = 20 \cdot 4$

$80 = 80$

Cross products can be used to find missing terms in proportions using a two-step process.

Step 1: Find the cross products.

Step 2: Divide the known product by the known factor.

$$\frac{12}{20} = \frac{n}{30}$$

$$12 \cdot 30 = 20n$$
$$360 = 20n$$
$$n = 18$$

$$20 \overline{)\,360}\quad 18$$
$$20$$
$$160$$
$$160$$
$$0$$

$$\frac{15}{x} = \frac{20}{32}$$

$$15 \cdot 32 = 20x$$
$$480 = 20x$$
$$x = 24$$

$$\frac{a}{12} = \frac{6}{8}$$

$$12 \cdot 6 = 8a$$
$$72 = 8a$$
$$a = 9$$

$$\frac{30}{25} = \frac{24}{d}$$

$25 \cdot 24 = 30d$

$600 = 30d$

$d = 20$

$$\begin{array}{r} 25 \\ \times 24 \\ \hline 100 \\ +500 \\ \hline 600 \end{array}$$

$$\frac{m}{100} = \frac{9}{12}$$

$100 \cdot 9 = 12m$

$900 = 12m$

$m = 75$

$$12\overline{)900}\quad 75,\ -84,\ 60$$

Assignment:

Problem Set 39