

10-4: What is a Proportion?



Objective: I will learn an easy way to check whether two ratios are equal.

***Proportion:** a pair of equal ratios. In a proportion, the cross products of the two ratios are equal.

****Cross product:** the result of multiplying the top value in one ratio by the bottom value in the other.

Note: Proportions often include different units of measurement. Units must be:

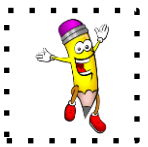
- * the same across the top and bottom *or*
- * the same down the left and right sides.

*If the units only match diagonally, then the ratios do not form a proportion.

To determine if two ratios form a proportion:



- 1) multiply the numerator of the first fraction by the denominator of the second fraction and
- 2) multiply the denominator of the first with the numerator of the second:



Example #1:

$$\frac{2}{5} = \frac{6}{15} \quad 2 \times 15 = 30 \text{ and } 5 \times 6 = 30$$

The cross products are equal, so the two ratios form a proportion.

****Decide if the ratios form a proportion:**

a. $\frac{6ft}{10sec} = \frac{9ft}{15sec}$

The units are the same
across the top and bottom.
The cross products are equal.

$$\begin{array}{l} 6 \times 15 = 90 \\ 10 \times 9 = 90 \end{array}$$

It is a proportion.

b. $\frac{4ft}{6ft} = \frac{12sec}{18sec}$

The units are the same
down the left and
right sides. The cross
products are equal.

$$\begin{array}{l} 4 \times 18 = 72 \\ 6 \times 12 = 72 \end{array}$$

It is a proportion.

c. $\frac{5ft}{10sec} = \frac{4sec}{8ft}$

The units are not the
same across or down.

It is not a proportion.



YOU GOT THIS:

****Decide if the ratios form a proportion:**

a. $\frac{2gallons}{36miles} = \frac{3gallons}{52miles}$

b. $\frac{\$11}{1meal} = \frac{\$22}{2dollars}$

c. $\frac{18bagels}{3packages} = \frac{15bagels}{2.5packages}$