Proportions

A PROPORTION is an equation that relates two equivalent ratios. Ratios are said to be in proportion if they can both be reduced to the same ratio.

$\frac{1}{2} = \frac{5}{10}$ This **is** a proportion.

$\frac{1}{2} = \frac{5}{8}$ This is **NOT** a proportion

You can check to see if two ratios are in proportion by cross-multiplying. The cross-products must be equal.

Proportion ✓ 72 72

$\frac{6}{9} = \frac{8}{12}$

Proportion ✗ 55 56

$\frac{5}{8} = \frac{7}{11}$

Example:

State whether the ratios are proportional. If they aren't proportional, change one of the numbers to make them proportional. Circle = or ≠ .

1) $\frac{6}{10} = \neq \frac{3}{5}$ $\frac{6}{10}$ (=) $\neq \frac{3}{5}$ They are in proportion.

You Try:

1) $\frac{4}{5} = \neq \frac{12}{15}$

2) $\frac{8}{12} = \neq \frac{2}{3}$

3) $\frac{7}{8} = \neq \frac{8}{9}$

4) $\frac{4}{5} = \neq \frac{7}{8}$

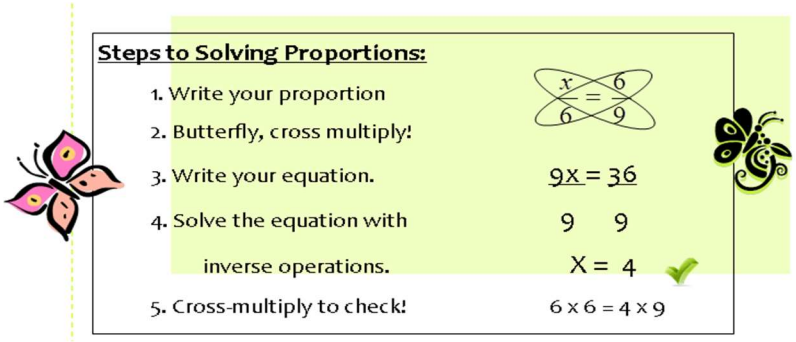
5) $\frac{4}{12} = \neq \frac{5}{15}$

6) $\frac{1}{3} = \neq \frac{1}{6}$

Solving Proportions

One way to solve proportions is to cross multiply and see what factor you need to make the cross-products equal.

Example:



Another way that you can solve a proportion is to find the factor that is shared across the numerator or denominator and use that same relationship to complete the proportion.

Example:

1) $\frac{4}{36} = \frac{u}{9}$ ÷4 $\frac{4}{36} = \frac{u}{9}$ ÷4 $u = 1$

2) $\frac{u}{36} = \frac{1}{9}$ ×4 $\frac{u}{36} = \frac{1}{9}$ ×4 $u = 4$

You Try:

Finding the missing number in the proportion:

1) $\frac{r}{15} = \frac{4}{20}$

2) $\frac{8}{10} = \frac{20}{y}$

3) $\frac{x}{30} = \frac{3}{4}$

4) $\frac{2,5}{5} = \frac{j}{4}$

5) $\frac{12}{a} = \frac{21}{7}$

6) $\frac{k}{3} = \frac{14}{21}$