Lesson 08: Proportions and Percents

Proportions

Vocabulary

Proportion	An equation that compares two equal fractions (or rates) Ex: $\frac{3}{5}=\frac{6}{10}$ is read "3 is to 5 as 6 is to 10"

TRY: Write the proportions.

5 is to 18 as 15 is to 54 $\frac{\square}{\square}=\frac{\square}{\square}$

4 is to 12 as 20 is to 60 $\frac{\square}{\square}=\frac{\square}{\square}$

Is this the same as:
If it takes 4 minutes to fold 12 books, working at the same rate, it will take 20 minutes to fold 60 books.

A proportion is known to be true if the **cross product**,
the product of the **extremes** equals the product of the **means**.

That is, $\frac{3}{5}=\frac{6}{10}$ when $3\cdot 10=5\cdot 6$

$extremes = means$

Extremes–Means Property.

If $\frac{a}{b}=\frac{c}{d}$, then $ad=bc$ provided that $b\neq 0$ and $d\neq 0$.

TRY: Determine whether each pair of fractions is equivalent.

$\frac{3}{7}=\frac{27}{63}$ $\frac{4}{5}=\frac{3}{4}$ $\frac{\frac{5}{1}}{\frac{}{4}}=\frac{200}{10}$

TRY: Use the extremes = means rule to find the value of x.

$\frac{6}{7}=\frac{x}{56}$ $\frac{3}{8}=\frac{5}{x}$ $\frac{\frac{2}{5}}{9}=\frac{10}{x}$ $\frac{0.8}{x}=\frac{5}{40}$

Proportion Problems

If 5 feet of rope costs $2.10, what would 7 feet of rope cost?

This problem can be thought of in two ways:

$\frac{5}{7} = \frac{2.10}{x}$ **OR** $\frac{5}{2.10} = \frac{7}{x}$ **Either way,** $5x = 7(2.10)$

TRY:

If 12 apples cost $4.80, what would 5 apples cost?

JJ worked 2.4 hours and received $8.64. If KT works 10 hours at the same rate of pay, how much will KT receive?

The paint machine can paint 30 signs in 2 minutes. How many signs can be painted in 4 hours?