Math 7 Notes
Section 1-6
Solving Proportions

A **proportion** is an equation stating that two ratios or rates are equivalent.

$\frac{2}{3} = \frac{4}{6}$ $\qquad$ $\frac{2}{5} \overset{\times 8}{=} \frac{n}{40}$ ($\times 8$ below the 5)

$n = 16$

In a proportion the cross products are equal.

$5 \cdot 4 = 20$ $\qquad$ $10 \cdot 2 = 20$

$\frac{5}{10} = \frac{2}{4}$

$\frac{10}{13} = \frac{n}{5}$

$10(5) = 13n$

$50 = 13n$

$\frac{50}{13} = \frac{13n}{13}$

$\frac{50}{13} = n$

$n = 3\frac{11}{13}$

$\frac{50}{39}$

Methods to Solve a Proportion

1) Use cross products and solve algebraically.

$\frac{4.2}{n} = \frac{8}{5}$

$4.2(5) = 8n$

$21 = 8n$

$\frac{21}{8} = \frac{8n}{8}$

$\frac{21}{8} = n$

$n = 2\frac{5}{8}$ or 2.625

① Write cross products with $=$ in between

② Do arithmetic

③ copy and step

④ Divide both sides by # in front of variable

⑤ Do arithmetic

Solve using algebraic steps: Round to nearest tenth

$\frac{n}{17} = \frac{5}{1.3}$

$n(1.3) = 17(5)$

$1.3n = 85$

$\frac{1.3n}{1.3} = \frac{85}{1.3}$

$n = 65.3846\ldots$ (↑ round here)

$n \approx 65.4$

Methods to Solve a Proportion

2) Use concept of equivalent ratios.

$\frac{4}{5} \overset{\times 2}{=} \frac{8}{n}$ $\qquad$ $\frac{24}{30} \overset{\div 3}{=} \frac{8}{n}$

$n = 10$ $\qquad$ $n = 10$

Methods to Solve a Proportion

3) Sometimes you can put one of the ratios in simplest form first.

$\frac{9}{15} = \frac{6}{n}$ $\qquad$ ~~$\frac{24}{30} = \frac{8}{n}$~~

$\downarrow$

$\frac{3}{5} \overset{\times 2}{=} \frac{6}{n}$

$n = 10$

Carla earns $74.25 for working 8 hours last week. How much will she earn for working 20 hours?

$\frac{\$ \text{ earned}}{\text{hours}}$ $\quad \frac{74.25}{8} = \frac{n}{20}$

$(74.25)(20) = 8n$

$1485 = 8n$

$\frac{1485}{8} = \frac{8n}{8}$

$185.625 = n$

$185.63

The ratio of salt to water in a certain solution is 2 to 17. If the solution contains 34 ounces of salt, how many ounces of water does it contain?

$\frac{\text{salt}}{\text{water}}$ $\quad \frac{2}{17} \overset{\times 17}{=} \frac{34}{n}$

$n =$ 289 oz of water