5.4 Solving Proportions

Ex: What are **3 different ways** to solve this proportion: $\frac{5}{7} = \frac{x}{21}$

Method 1: Mental Math

$\frac{5}{7} \overset{\times 3}{=} \frac{x}{21}$ (×3)

$x = 5(3)$

$\boxed{x = 15}$

Method 2: Multiplication Property of Equality

$\left(\frac{21}{1}\right)\frac{5}{7} = \frac{x}{21}\left(\frac{21}{1}\right)$

$15 = 1x$

$\boxed{x = 15}$

Method 3: Cross Products Property

$\frac{5}{7} = \frac{x}{21}$

$7(x) = 5(21)$

$\frac{7x}{7} = \frac{105}{7}$

$\boxed{x = 15}$

Solve each proportion.

Ex: $\frac{x}{8} = \frac{4}{10}$

* CANNOT cross reduce !!!

$10(x) = 4(8)$

$\frac{10x}{10} = \frac{32}{10}$

$\boxed{x = 3.2}$

√: $\frac{x}{8} = \frac{4}{10}$

$\frac{(3.2)}{8} \overset{?}{=} \frac{4}{10}$

$0.4 \overset{\checkmark}{=} 0.4$

Ex: $\frac{5}{2} = \frac{d-2}{4}$

$2(d-2) = 5(4)$

$2d - 4 = 20$

$+4 \quad +4$

$\frac{2d}{2} = \frac{24}{2}$

$\boxed{d = 12}$

√: $\frac{5}{2} = \frac{d-2}{4}$

$\frac{5}{2} \overset{?}{=} \frac{(12)-2}{4}$

$\frac{5}{2} \overset{?}{=} \frac{10 \div 2}{4 \div 2}$

$\frac{5}{2} \overset{\checkmark}{=} \frac{5}{2}$

Try These:

Solve the proportions.

(1) $\frac{w}{6} = \frac{6}{9}$ $\boxed{w = 4}$

* can reduce $\frac{6}{9}$ first

* cannot cross reduce!

(2) $\frac{12}{10} = \frac{a}{15}$ $\boxed{a = 18}$

* can reduce $\frac{12}{10}$ first

(3) $\frac{y}{6} = \frac{2}{4}$ $\boxed{y = 3}$

* can reduce $\frac{2}{4}$ first

(4) $\frac{2}{7} = \frac{x}{28}$ $\boxed{x = 8}$

* cannot cross reduce!

(5) $\frac{12}{5} = \frac{6}{y}$ $\boxed{y = 2.5}$ $\boxed{y = 2\frac{1}{2}}$ $\boxed{y = \frac{5}{2}}$

(6) $\frac{40}{z+1} = \frac{15}{6}$ $\boxed{z = 15}$

* can reduce $\frac{15}{6}$ first