Ch 2-6: Ratios & Proportions

9/20/2017

- 3 ways to write a ratio (fraction): x to y (words), $x:y$ (colon), $\frac{x}{y}$ (fraction)

- determine equivalent ratios:

Are $\frac{8}{20}$ and $\frac{16}{40}$ equivalent? → do they fully reduce to be equal?

$\frac{8}{20} \overset{\div 4}{=} \boxed{\frac{2}{5}}$ $\quad$ $\frac{16}{40} \overset{\div 8}{=} \boxed{\frac{2}{5}}$ $\quad$ yes

Proportions: set 2 ratios (fractions) equal to each other

★ Key Concept: Means-Extremes Property of Proportion

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

Ex. $\frac{6}{7} = \frac{18}{21}$

$6(21) = 7(18)$

$126 = 126$

Non-Ex. $\frac{1}{3} = \frac{4}{5}$

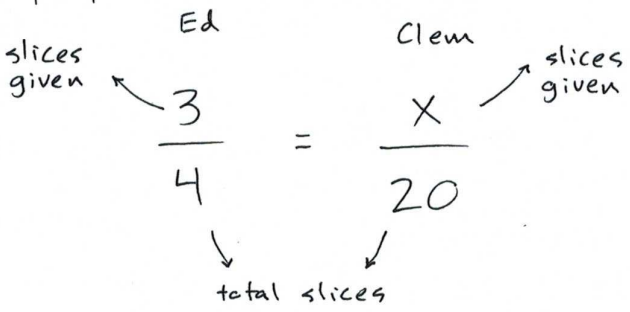
$3(4) = 1(5)$

$12 \neq 5$

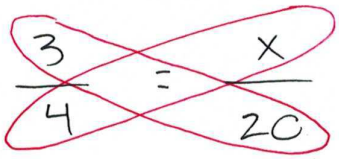
Solving Proportions

Ed and Clem order 2 large pizzas. Ed has his cut into 4 slices, Clem has his cut into 20 slices. They both give away the same amount of pizza to their friends. If Ed gave 3 slices, how many did Clem give?

Setup a proportion.



Solve using Means-Extreme Property of proportions (cross-multiply)

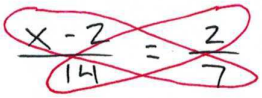


$3(20) = 4(x)$

$60 = 4x$

$\boxed{15 = x}$ → Clem gave 15 slices

Solving w/ variables & operations



$2(14) = 7(x-2)$ → must multiply both terms!

$28 = 7x - 14$

$+14 \quad +14$

$\frac{42}{7} = \frac{7x}{7}$

$\boxed{6 = x}$ → check!

$\frac{6-2}{14} = \frac{2}{7}$

$\frac{4}{14} = \frac{2}{7}$ ✓