Class-Notes Date_____Period_____

L1: Solving Ratios and Proportions (6.1, 6.2, 6.3)

Goal: Solve problems by writing and solving proportions

Example 1: Solve the proportion. CROSS-MULTIPLY

$\frac{3}{x+1} = \frac{2}{x}$

$3x = 2(x+1)$

$3x = 2x + 2$

$-2x \quad -2x$

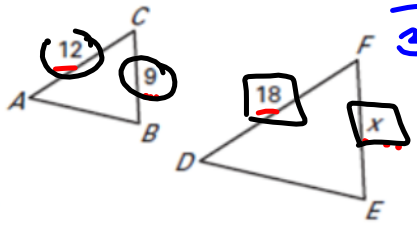
$x = 2$

$3x = 2x + 2$

$x = 1$

Example 2: Use properties of proportions. The triangles are proportional.

A. Find the value of x.



$\frac{2}{3}\frac{12}{18} = \frac{9}{x}$

$\frac{4}{3}\frac{12}{9} = \frac{18}{x}$

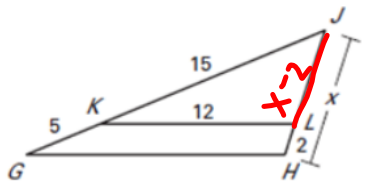
$4x = 54$

$x = 13.5$

$\frac{2x}{2} = \frac{27}{2}$

$x = 13.5$

B. Use the given proportions to solve for the missing information. $\frac{JL}{LH} = \frac{JK}{KG}$. Find *JH* and *JL*.



$2x$

$2x$

$x-2$

$x-2 = x+2$

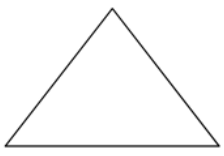
$\frac{x-2}{2} = \frac{3}{1}$

$x-2 = 6$

$+2 \quad +2$

$x = 8$

Example 3: The measures of the angles in △BCD are in the extended ratio of 2: 3: 4. Find the measures of the angles.



$2x + 3x + 4x = 180$

$9x = 180$

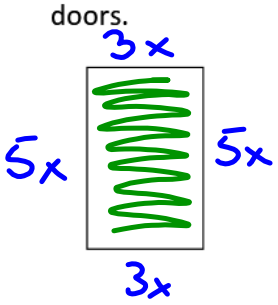
$x = 20$

$2(20) = 40°$

$3(20) = 60°$

$4(20) = 80°$

Example 4: You are painting barn doors. You know that the perimeter of the doors is 64 feet and that the ratio of the length to the height is 3: 5. Find the length, height and area of the doors.



$l = 3x \quad h = 5x$

$P = 2(3x) + 2(5x) = 64$

$16x = 64$

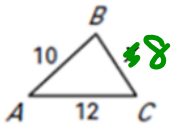
$x = 4$

$l = 3(4) = 12$ ft

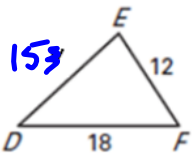
$h = (5)(4) = 20$ ft

$A = l \cdot h = 12 \cdot 20 = 240$ ft^2

Example 5: In the diagram $\triangle ABC \sim \triangle DEF$.



A) Solve for x and y.



$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} \rightarrow \frac{10}{Y} = \frac{X}{12} = \frac{12}{18} = \frac{2}{3}$

$\frac{10}{Y} = \frac{2}{3} \rightarrow 2Y = 30$

$Y = 15$

$\frac{X}{12} = \frac{2}{3} \rightarrow 3X = 24$

$X = 8$

B. Find the scale factor of $\triangle ABC$ to $\triangle DEF$.

$\frac{2}{3}$

C. Find the perimeters of $\triangle ABC$ and $\triangle DEF$.

$P_{\triangle ABC} = 30 \quad P_{\triangle DEF} = 45$

D. Find the ratio of the perimeter of $\triangle ABC$ to $\triangle DEF$. Find the ratio of the perimeter of $\triangle DEF$ to $\triangle ABC$.

$\frac{P_{\triangle ABC}}{P_{\triangle DEF}} = \frac{30}{45} = \frac{2}{3} \qquad \frac{P_{\triangle DEF}}{P_{\triangle ABC}} = \frac{3}{2}$

Example 6: Use exchange rates to convert currency.

On Jan 20, 2017, the exchange rate of Euros to American Dollars is 1 to 1.07. If you have $500 USD for spending money for a trip and want to exchange it, how many Euros will you have?

$\frac{1 \text{ Eu}}{\$1.07} = \frac{X \text{ Eu}}{\$500} \qquad \frac{1.07X}{1.07} = \frac{500}{1.07} \qquad X \approx 467.29 \text{ Eu}$