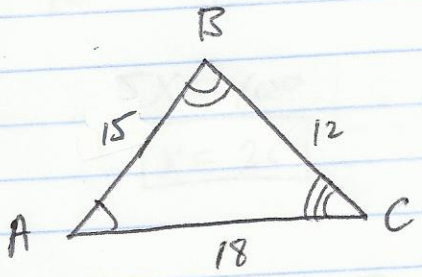
7-2 Similar Polygons

Two polygons are similar ($\sim$) if:

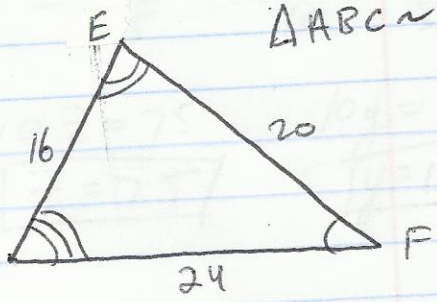
1) corresponding $\angle$s are $\cong$.
2) " sides are proportional.

Similarity ratio: ratio of lengths of corresponding sides (similar to scale factor)

Ex)



$\triangle ABC \sim \triangle FED$

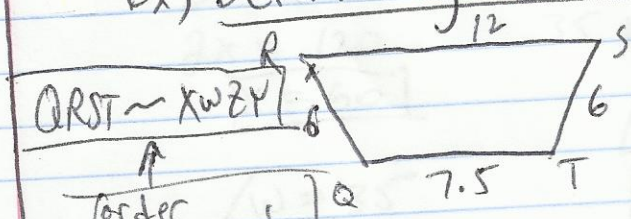


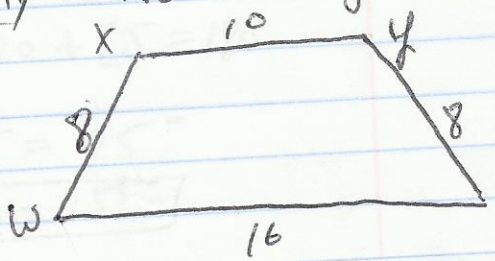
$\angle A \cong \angle F$, $\angle B \cong \angle E$, $\angle C \cong \angle D$

$\frac{AC}{DF} = \frac{AB}{EF} = \frac{BC}{DE}$

* Be careful to check the similarity statement for corresponding parts. before setting up proportions.

Ex) Determining Similarity: Are the figures $\sim$?





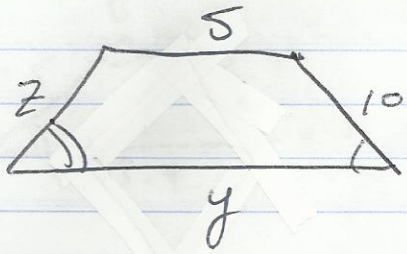
YES, QRST $\sim$ XWZY

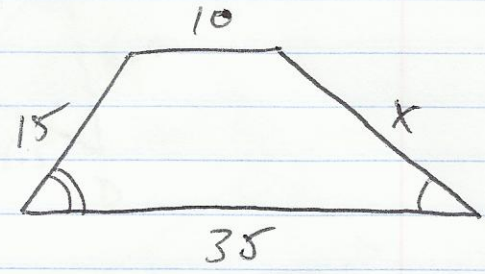
order matters!

$\frac{QR}{WX} = \frac{6}{8} = \boxed{\frac{3}{4}}$ $\frac{RS}{WZ} = \frac{12}{16} = \boxed{\frac{3}{4}}$ $\frac{QT}{XY} = \frac{2.5}{10} = \boxed{\frac{3}{4}}$

* Check Similarity ratio for all pairs of corresponding sides.

Ex) Using Similarity: The polygons are ~. Find x, y, z.



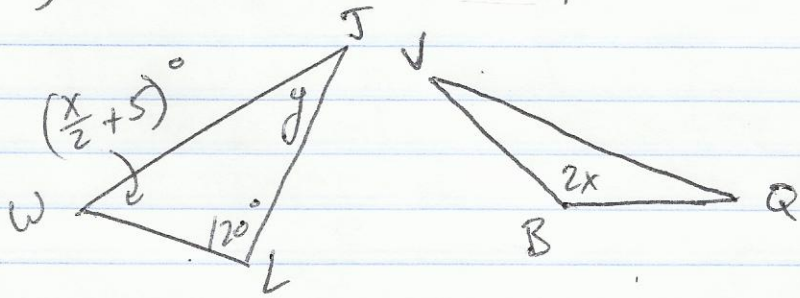


$\frac{5}{10} = \frac{10}{x}$ $\frac{5}{10} = \frac{z}{15}$ $\frac{5}{10} = \frac{y}{35}$

$5x = 100$ $10z = 75$ $10y = 175$

$\boxed{x = 20}$ $\boxed{z = 7.5}$ $\boxed{y = 17.5}$

Ex) $\triangle WLJ \sim \triangle QBV$; Find x and y



$\angle Q \cong \angle W$

$\angle V \cong \angle J$

$\angle B \cong \angle L$

$\angle B \cong \angle L$

$2x = 120$

$\boxed{x = 60}$

$\angle W = 35^\circ$

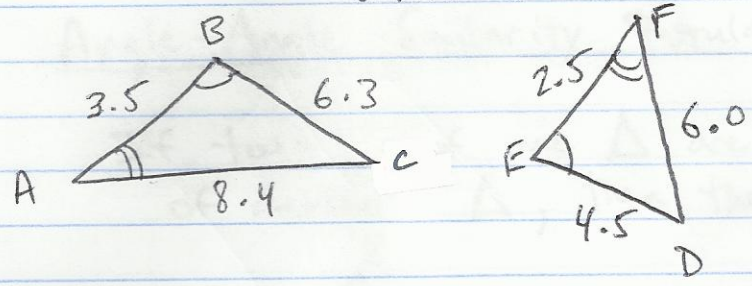
$\angle W + \angle L + \angle J = 180$

$35 + 120 + \angle J = 180$

$\angle J = 25^\circ$

$\boxed{y = 25}$

Practice: Are the figures similar? If so, write a similarity statement.



$\frac{BC}{ED} = \frac{6.3}{4.5} = \boxed{1.4}$ $\frac{AC}{DF} = \frac{8.4}{6.0} = \boxed{1.4}$

$\frac{AB}{EF} = \frac{3.5}{2.5} = \boxed{1.4}$ YES, $\underline{\triangle ABC \sim \triangle FED}$

watch the order!