Polygon Similarity

IC3

Polygons are **similar** if and only if:

1) All pairs of corresponding sides are Proportional/have same scale factor.

2) All pairs of corresponding angles are $\cong$.

Notation for Similarity:

$\sim$

Using similarity statements: If $\Delta ABC \sim \Delta DEF$ then corresponding…

Angles ARE $\cong$

$\angle A \cong \angle D$

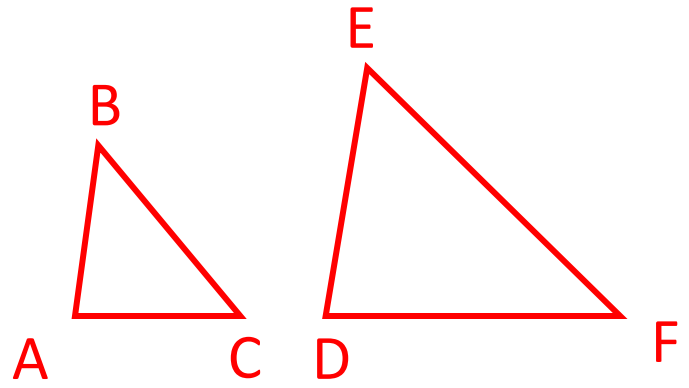
$\angle B \cong \angle E$

$\angle C \cong \angle F$

SIDES ARE Proportional

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

DIAGRAM



Examples:

1. Given that $\Delta AFG \sim \Delta DRH$. Complete the following.

$\angle H \cong \angle$ G

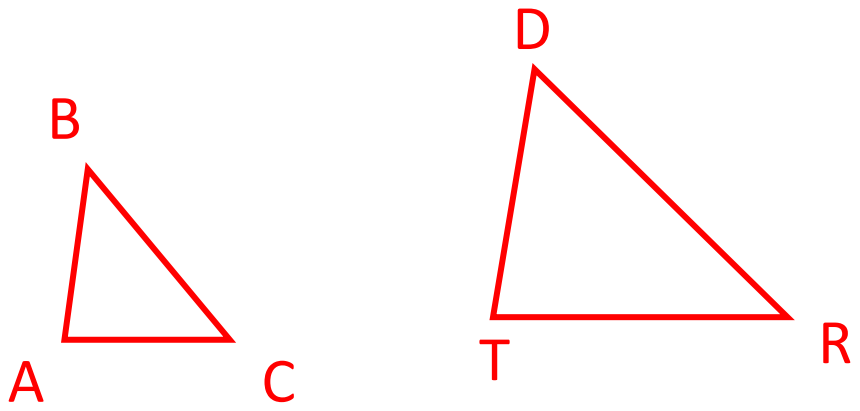
$$\frac{DR}{AF} = \frac{DH}{AG}$$

$\angle D \cong \angle$ A

$$\frac{FG}{RH} = \frac{AG}{DH}$$

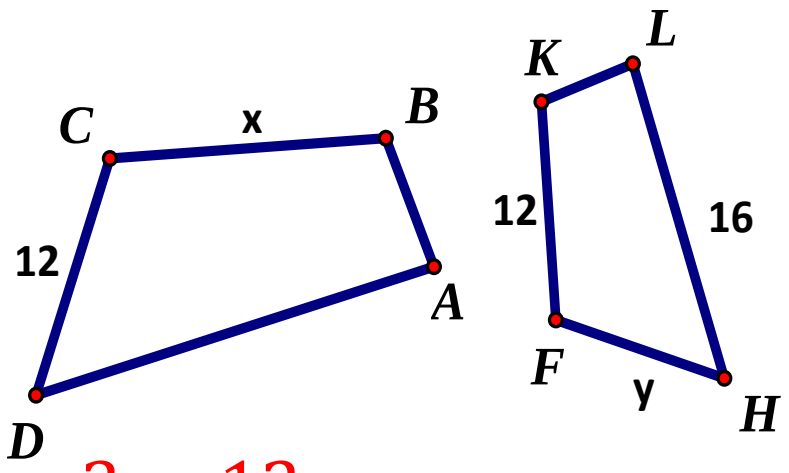
2. ΔABC is similar to another triangle. Provided is some information about the two triangles, $\frac{BC}{DR} = \frac{AB}{TD}$ From this information determine the triangle similarity statement.

$\Delta ABC \sim \Delta$ TDR



3. Use the scale factor to determine the missing values.

a) CBAD : FKLH is 3:2



$\frac{3}{2} = \frac{12}{y}$

3y = 2(12)

3y = 24

y = 8

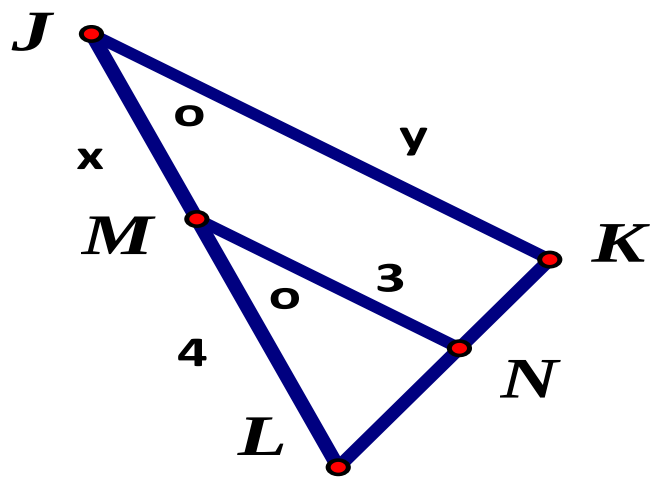
$\frac{3}{2} = \frac{x}{12}$

3(12) = 2x

36 = 2x

x = 18

b) $\Delta LMN : \Delta LJK$ is 1:2



$\frac{1}{2} = \frac{4}{4+x}$

1(4 + x) = 2(4)

4 + x = 8

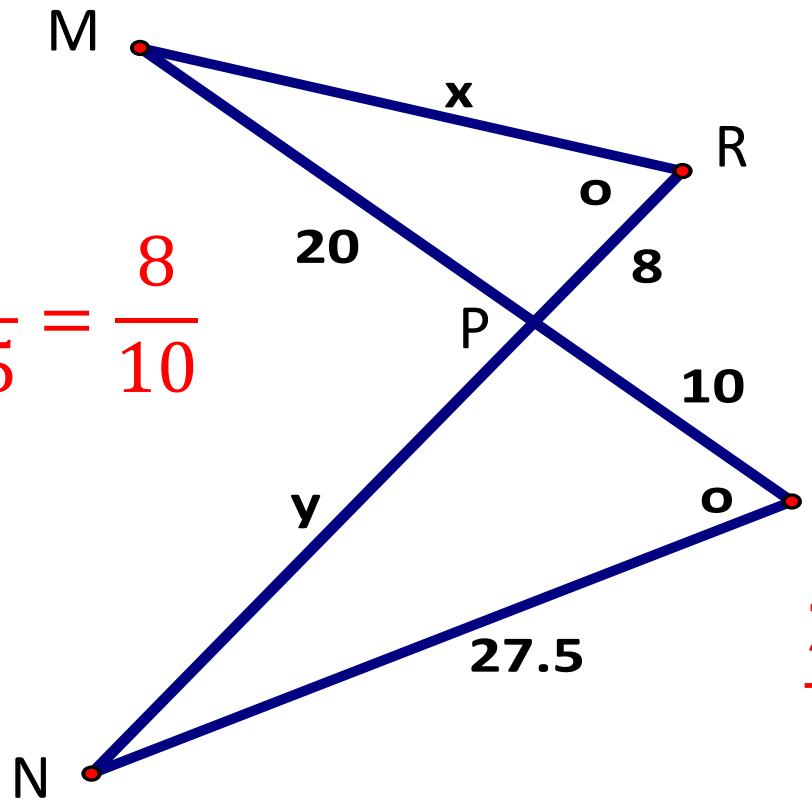
x = 4

$\frac{1}{2} = \frac{3}{y}$

y = 6

4. Solve for the missing information, given that the two triangles in each question are SIMILAR. Write a similarity statement first.

a) Similarity Statement: ΔMRP ~ ΔNTP

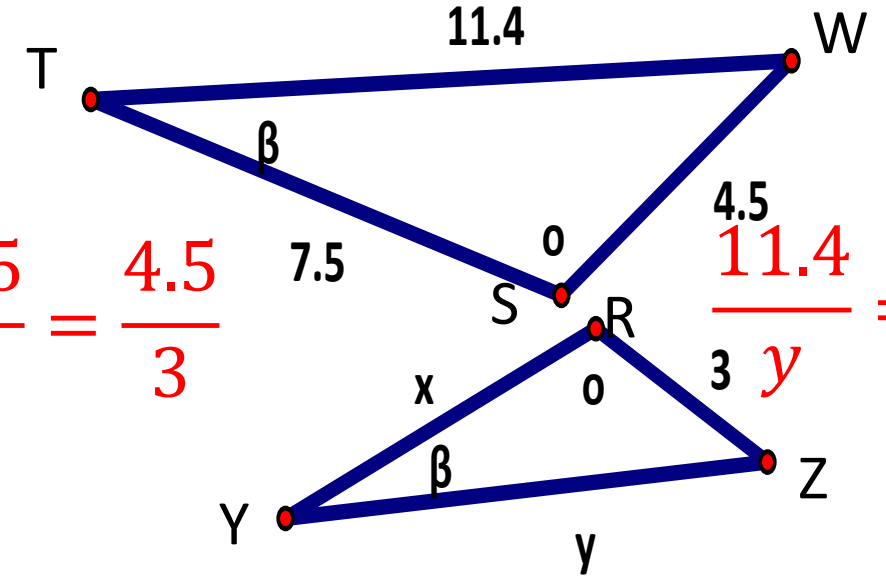


$\frac{x}{27.5} = \frac{8}{10}$

$\frac{20}{y} = \frac{8}{10}$

x = 22 y = 25

b) Similarity Statement: ΔTWS ~ ΔYZR

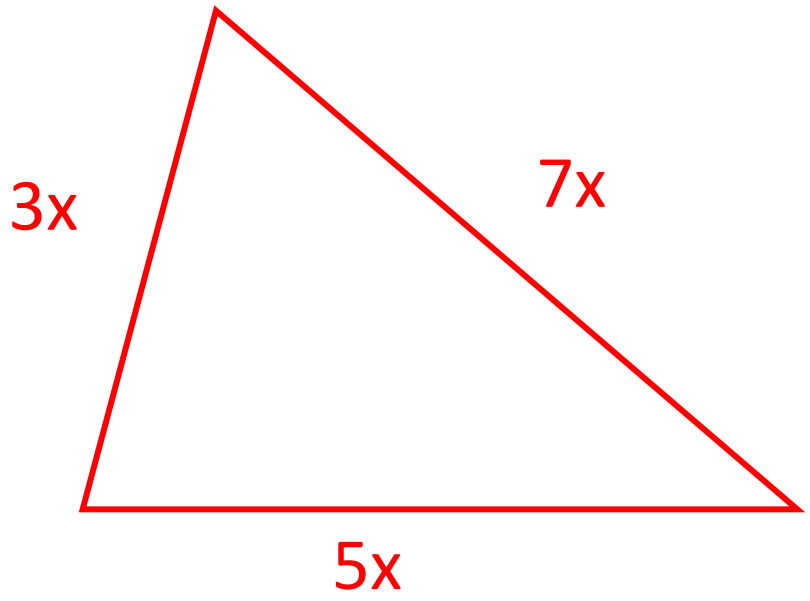


$\frac{7.5}{x} = \frac{4.5}{3}$

$\frac{11.4}{y} = \frac{4.5}{3}$

x = 5 y = 7.6

5. If the three sides of a triangle are in ratio of 3:5:7 and the perimeter of the triangle is 12 cm. What is the length of the longest side?



$3x + 7x + 5x = 12$

$15x = 12$

$x = 0.8$

$7(0.8) = 5.6$ cm