

Define what similar polygons are...

\cong 4's $\frac{1}{2}$ proportional sides

How are similar polygons different from congruent polygons?

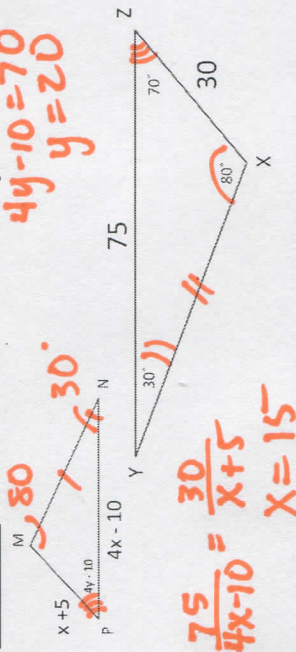
proportional sides

OBJECTIVE 1: Similar Polygons, ~

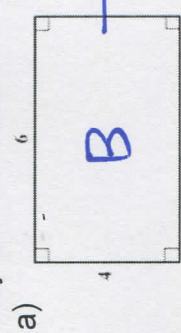
- All corresponding angles are congruent (exactly the same)
- All corresponding sides are proportional (reduced or enlarged by the same amount)

OBJECTIVE 2: Finding Corresponding Lengths & Angles in ~ Polygons

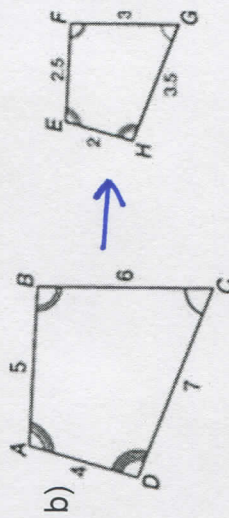
TASK 3: Find the value of x and y if $\triangle MNP \sim \triangle XYZ$.



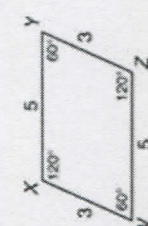
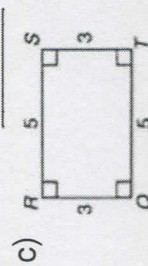
TASK 2: Explain if the following quadrilaterals are similar or not. If yes, state the similarity ratio. If no, then explain why they are not similar.



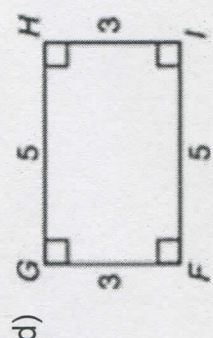
$\frac{4}{2} = \frac{6}{3}$
 \checkmark
 $\frac{4}{3} = \frac{4}{2}$
 $SR = 2$



$\frac{5}{2.5} = \frac{6}{3}$
 $SR = \frac{1}{2}$



no, \neq 4's



$\frac{5}{3} \neq \frac{3}{3}$
 NO SR

OBJECTIVE 3: Perimeters of Similar Polygons

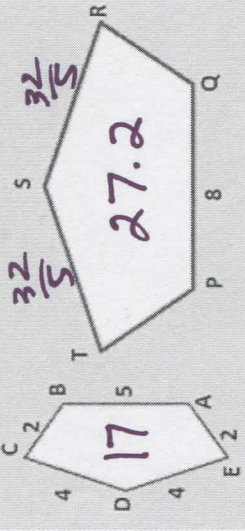
In the given diagram polygon $ABCDE \sim PQRST$.

- If two polygons are SIMILAR (\sim), then the ratio of their perimeters is equal to the ratio of their corresponding side lengths.

TASK 4: Perimeters of Similar Polygons

Find the perimeter of the larger polygon, if the perimeter of the smaller polygon is 48 cm and the similarity ratio is 2 to 3. HINT: draw and label to polygons.

$$\frac{x}{48} = \frac{3}{2} \Rightarrow 2x = 144 \quad x = \boxed{72\text{cm}}$$



$$\frac{8}{5} = \frac{x}{4}$$

$$32 = 5x$$

$$x = \frac{32}{5}$$

$$\frac{8}{5} = \frac{x}{2}$$

$$x = \frac{16}{5}$$

$$5x = 16$$

OBJECTIVE 4: Areas of Similar Polygons

- If two polygons are SIMILAR (\sim), then the ratio of their perimeters is equal to the squares of the ratios of their corresponding side lengths.

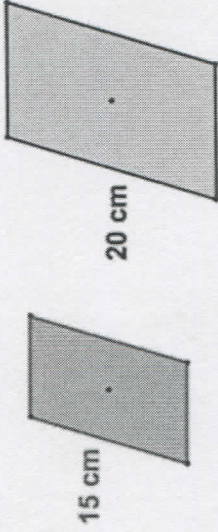
TASK 5: Areas of Similar Polygons

Area of the larger triangle: 96cm^2

Base of the larger triangle: 12 cm

Base of the smaller triangle: 3 cm

HINT: draw and label your two triangles



$$A = ?? \text{ cm}^2 \quad A = 240 \text{ cm}^2$$

$$\frac{3}{12} = \frac{\sqrt{96}}{\sqrt{x}}$$

$$\frac{\sqrt{x}}{3} = \frac{12\sqrt{96}}{3} \Rightarrow (\sqrt{x})^2 = \left(\frac{12\sqrt{96}}{3}\right)^2 = \boxed{6\text{cm}^2}$$

$$\frac{20}{15} = \frac{\sqrt{240}}{\sqrt{x}}$$

TASK 6: Predicting...

If perimeter is one to one, and area is perimeter squared. What do we predict will be the ratio from perimeter to volume?

area is squared so... (perimeter)³ = volume

Still need help with:

OR perimeter = $\sqrt[3]{\text{volume}}$