APRIL 12, 2019

UNIT 7: SIMILARITY AND TRANSFORMATIONS

7.3: SIMILAR POLYGONS

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

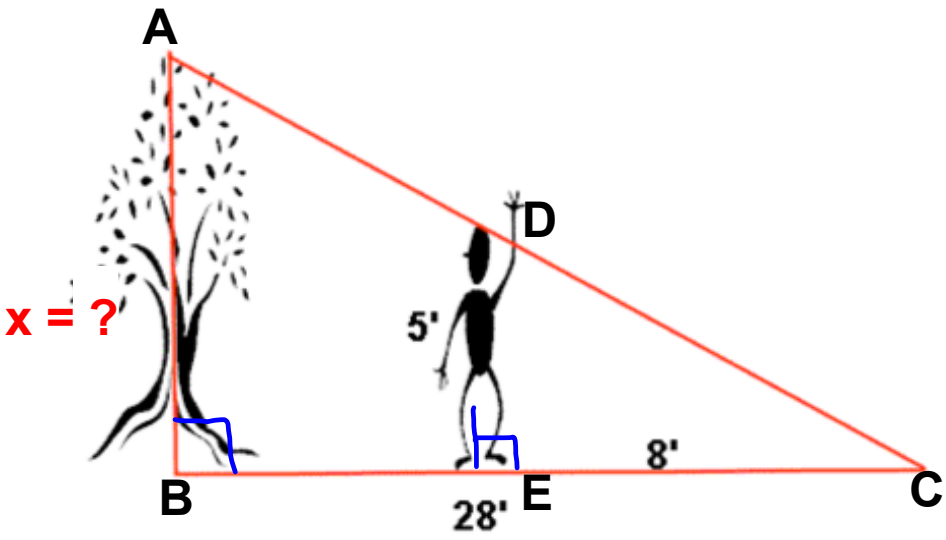
We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 3" OR "SS3" which states:

"Demonstrate an understanding of similarity of polygons."

WARM UP QUIZ:

a) Prove that these 2 triangles are similar.

b) Find the height of the tree to the nearest tenth of a metre.



At a certain time of the day, the shadow of a 5' boy is 8' long. The shadow of a tree at this same time is 28' long. How tall is the tree?

SIMILAR POLYGONS

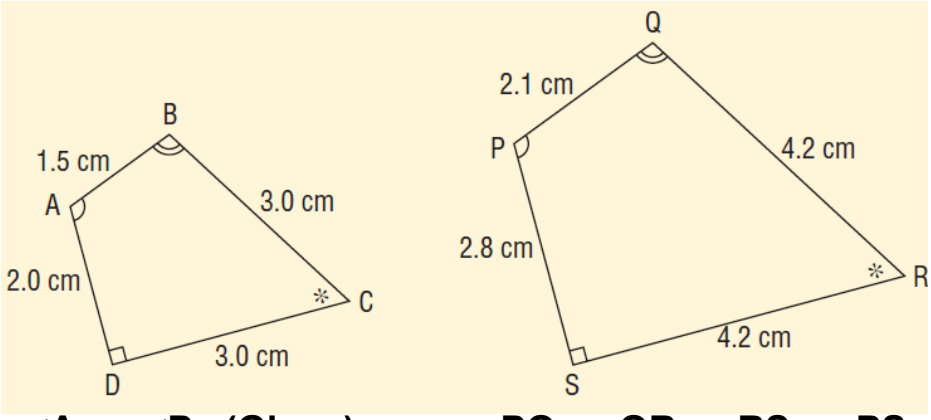
TO IDENTIFY SIMILAR POLYGONS:

* the measures of corresponding angles must be EQUAL

** AND **

* the ratios of the lengths of the corresponding sides must be EQUAL; in other words, corresponding sides are proportional

EXAMPLE: **PROVE that quadrilateral ABCD is SIMILAR TO quadrilateral PQRS.**



<A = <P (Given)
<B = <Q (Given)
<C = <R (Given)
<D = <S (Given)

AND

$$\frac{PQ}{AB} = \frac{QR}{BC} = \frac{RS}{CD} = \frac{PS}{AD}$$

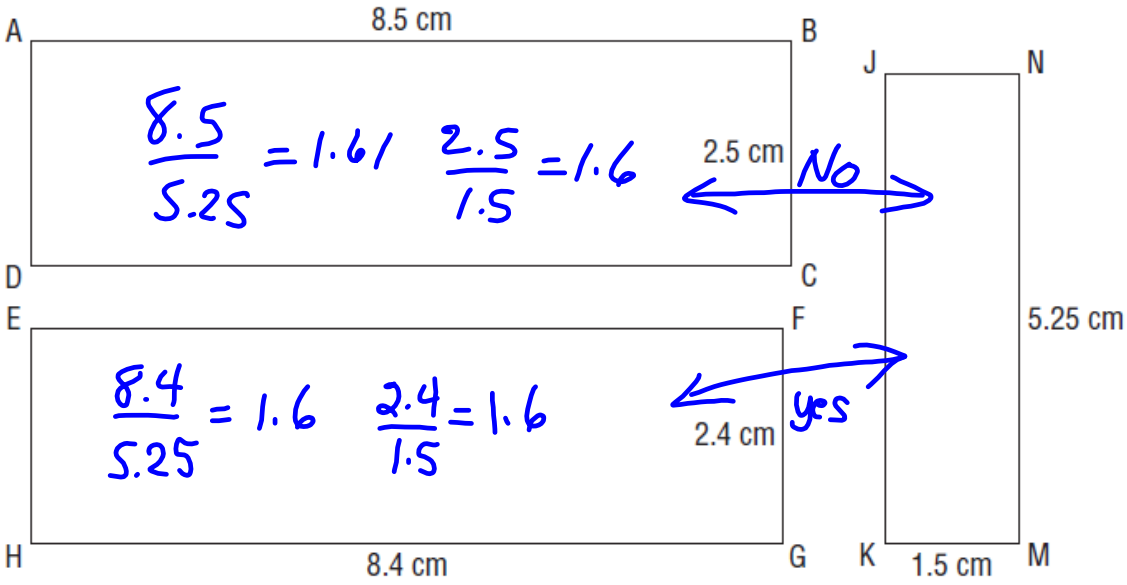
$$\frac{2.1}{1.5} = \frac{4.2}{3.0} = \frac{4.2}{3.0} = \frac{2.8}{2.0}$$

$$1.4 = 1.4 = 1.4 = 1.4$$

∴quadrilateral ABCD ~ quadrilateral PQRS

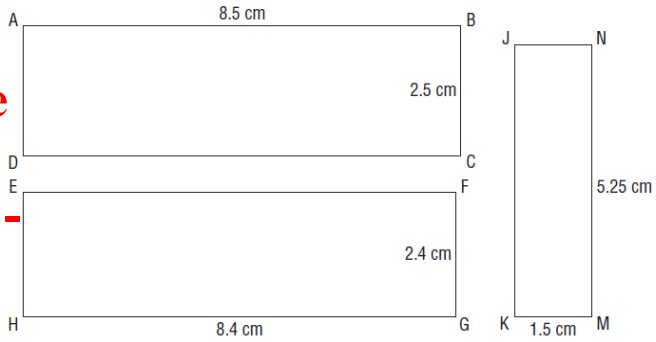
EXAMPLE:

Identify pairs of similar rectangles. Justify the answer.



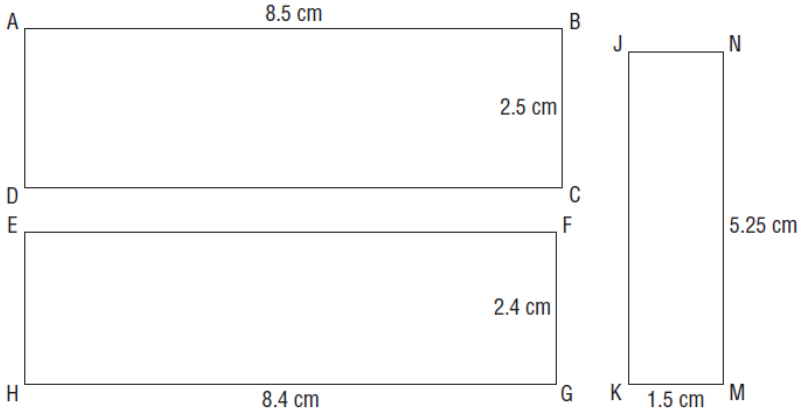
We are told that these shapes are rectangles. All angles in a rectangle measure 90° ; therefore, we do not have to "prove" anything about the angles - it is "given" that these shapes are rectangles.

Identify pairs of similar rectangles. Justify the answer.



We also know that rectangles have two pairs of congruent sides; therefore, the only thing we need to "prove" are the ratios of two pairs of corresponding sides are equal.

Identify pairs of similar rectangles. Justify the answer.



$$\frac{GH}{MN} = \frac{FG}{KM}$$

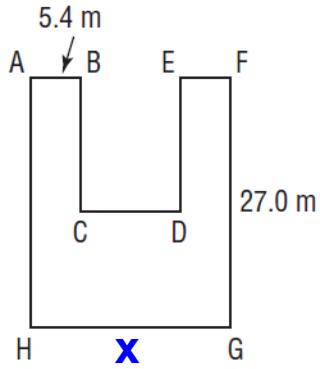
$$\frac{8.4}{5.25} = \frac{2.4}{1.5}$$

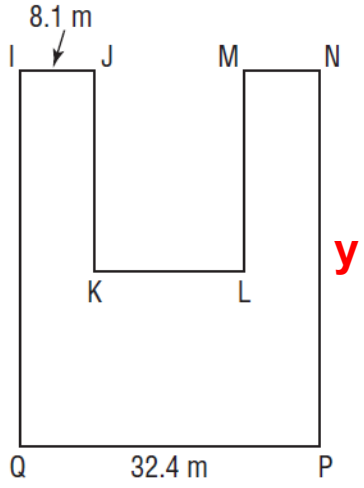
$$1.6 = 1.6$$

∴rectangle EFGH ~ rectangle JKMN

EXAMPLE 2:

These 2 octagonal garden plots are SIMILAR. Calculate the length of GH and NP.





$\frac{x}{32.4} = \frac{5.4}{8.1}$

$x = \frac{5.4(32.4)}{8.1}$

$= 21.6\text{ m}$

$\frac{y}{27.0} = \frac{8.1}{5.4}$

$y = \frac{27.0(8.1)}{5.4}$

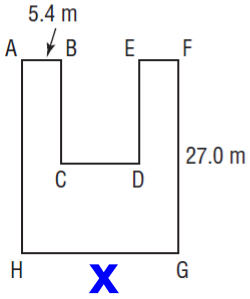
$= 40.5\text{ m}$

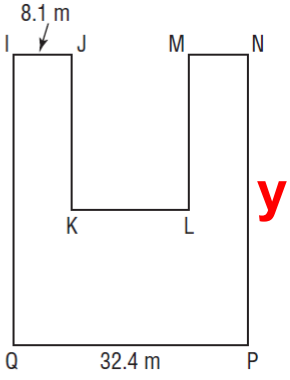
$$\frac{GH}{PQ} = \frac{AB}{IJ}$$

$$\frac{x}{32.4} = \frac{5.4}{8.1}$$

$$8.1x = 174.96$$

$$x = 21.6\text{ m}$$





$$\frac{NP}{FG} = \frac{IJ}{AB}$$

$$\frac{y}{27.0} = \frac{8.1}{5.4}$$

$$5.4y = 218.7$$

$$y = 40.5\text{ m}$$

Worksheet on similar triangles

-completed in class

CONCEPT REINFORCEMENT:

***MMS9*:**

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