APRIL 16, 2018

UNIT 7: SIMILARITY AND TRANSFORMATIONS

7.3: SIMILAR POLYGONS

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

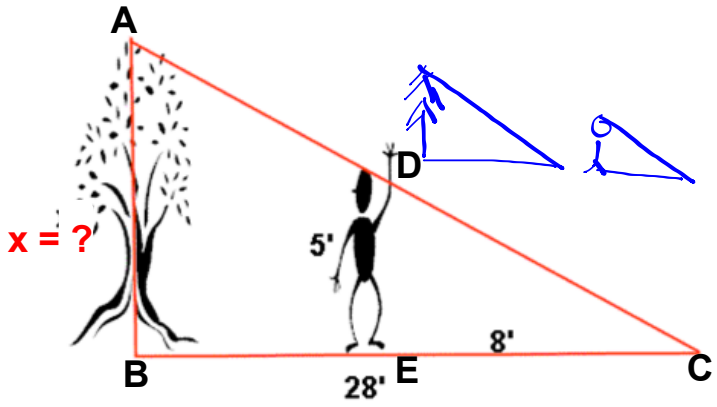
We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 3" OR "SS3" which states:

"Demonstrate an understanding of similarity of polygons."

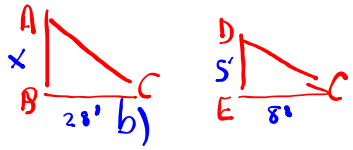
WARM UP QUIZ:

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?



a) $\angle B = \angle DEC$ Given

$\angle C = \angle C$ Common

$\angle A = \angle EDC$ SATT

$\triangle ABC \sim \triangle DEC$ by AAA

b) $\frac{x}{5} = \frac{28}{8}$

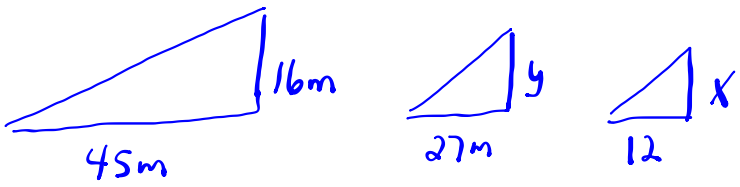
$x = \frac{28(5)}{8}$

$= 17.5'$

HOMEWORK QUESTIONS?

(pages 350 / 351, #9 to #15)

#15.



$\frac{y}{16} = \frac{27}{45}$

$y = \frac{27(16)}{45}$

$= 9.6m$

$\frac{x}{16} = \frac{12}{45}$

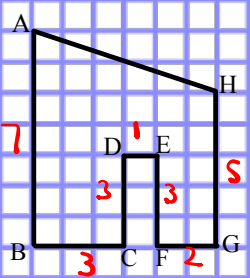
$x = \frac{12(16)}{45}$

$= 4.3m$

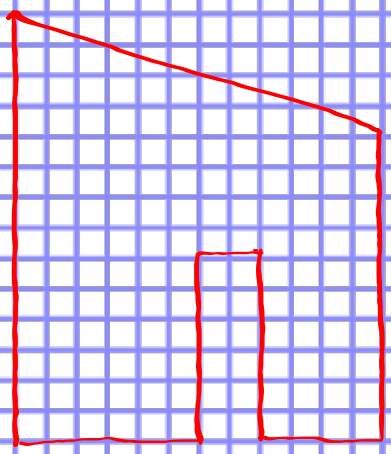
Activity

(Label your second polygonIJKLMNOP counterclockwise from the top left corner.)

Original Shape



Doubled



Activity

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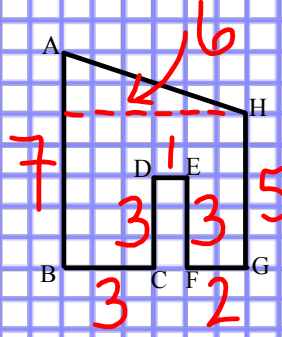
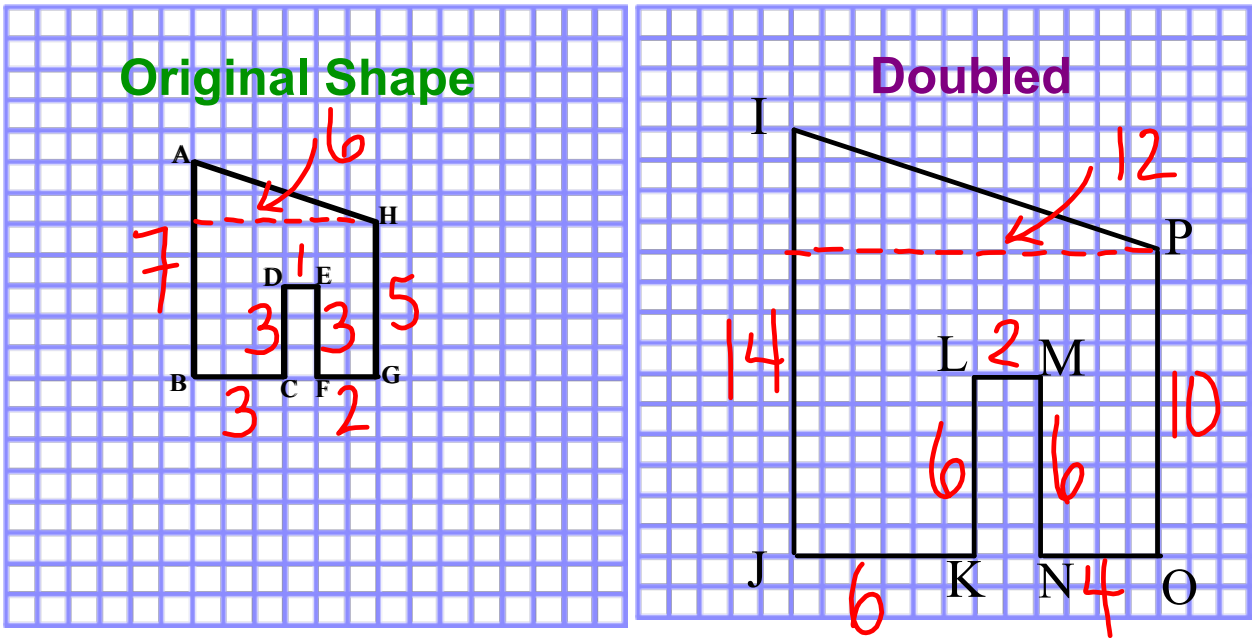
Original Shape



Doubled

Activity

(Label your second polygon IJKLMNOP counterclockwise from the top left corner.)



SIMILAR POLYGONS

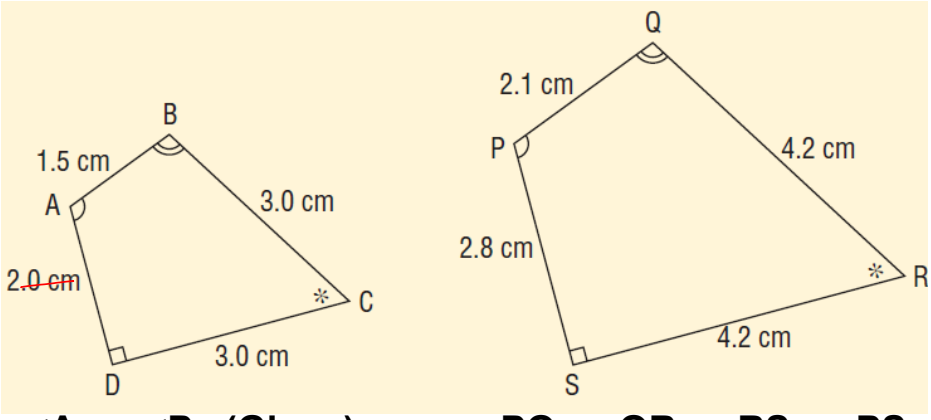
TO IDENTIFY SIMILAR POLYGONS:

* 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

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

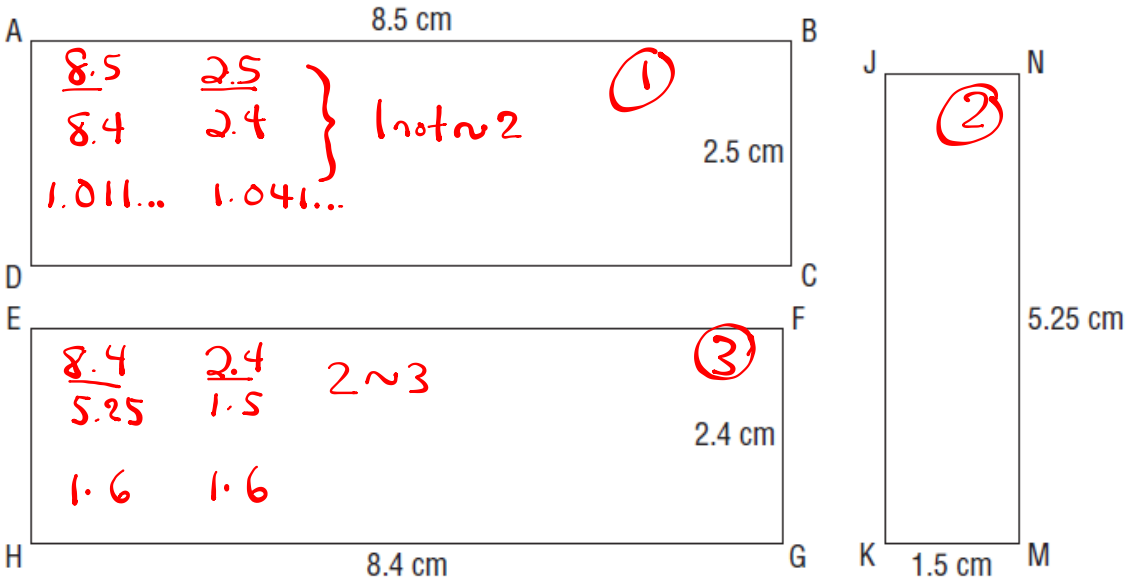
$\frac{2.1}{1.5} = \frac{4.2}{3.0} = \frac{4.2}{3.0} = \frac{2.8}{2.0}$

$1.4 = 1.4 = 1.4 = 1.4$

∴ quadrilateral ABCD ~ quadrilateral PQRS

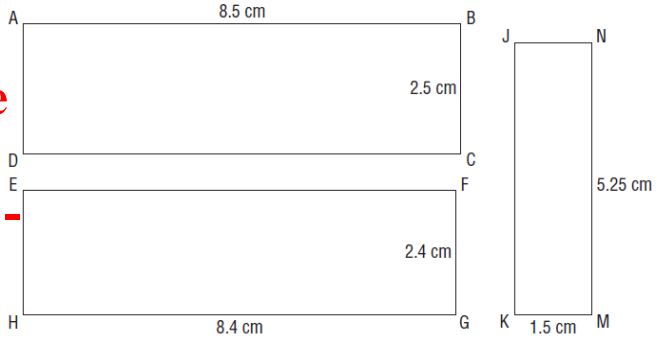
EXAMPLE:

Identify pairs of similar rectangles. Justify the answer.



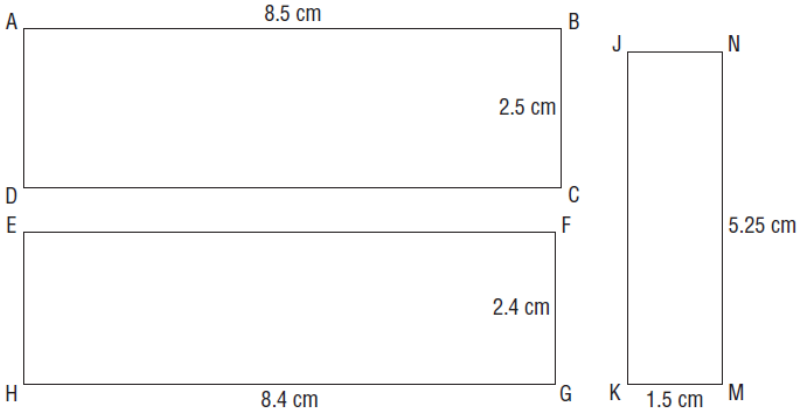
We are told that these shapes are rectangles. All angles in a rectangle measure 90°; therefore, we do not have to "prove" anything about the angles - it is "given" that these shapes are rectangles.

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.



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

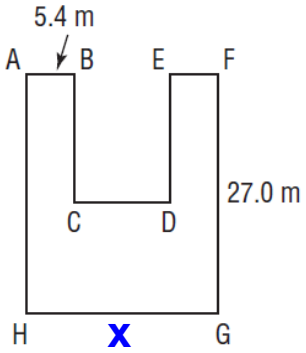
$$\frac{8.4}{5.25} = \frac{2.4}{1.5}$$

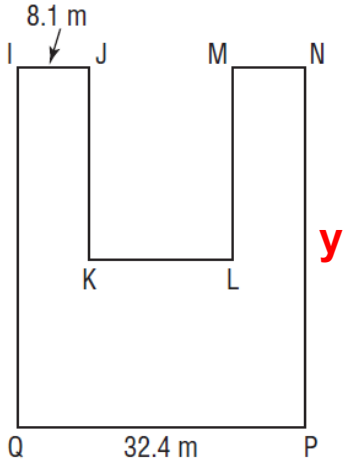
$$1.6 = 1.6$$

$\therefore$ rectangle EFGH ~ rectangle JKMN

EXAMPLE 2:

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





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

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

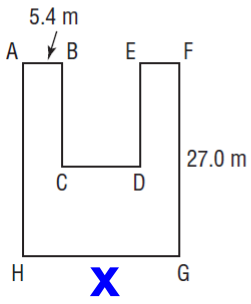
$= 21.6\text{ m}$

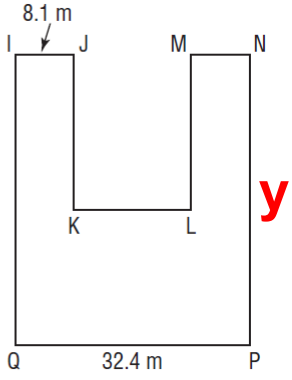
$\frac{y}{27.0} = \frac{8.1}{5.4}$

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

$= 40.5\text{ m}$

$$\frac{GH}{PQ} = \frac{AB}{IJ}$$
$$\frac{x}{32.4} = \frac{5.4}{8.1}$$
$$8.1x = 174.96$$
$$x = 21.6\text{ m}$$

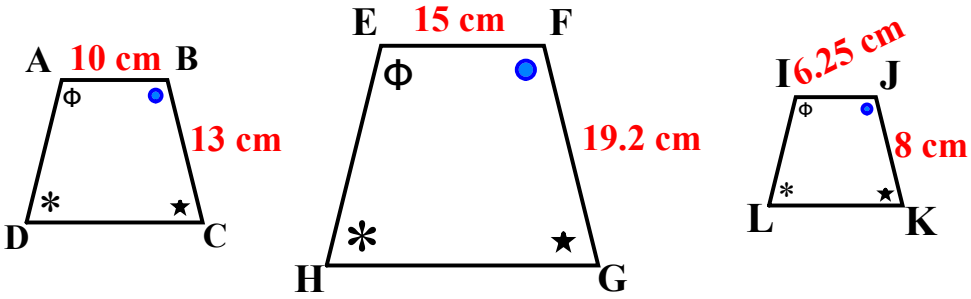




$$\frac{NP}{FG} = \frac{IJ}{AB}$$
$$\frac{y}{27.0} = \frac{8.1}{5.4}$$
$$5.4y = 218.7$$
$$y = 40.5\text{ m}$$

WARM UP:

Which two trapezoids are similar? Show all work.



<K = <K (Given)
<L = <L (Given)

AND

$\frac{EF}{IJ} = \frac{FG}{JK}$

$\frac{15}{6.25} = \frac{19.2}{8}$

2.4 = 2.4

∴ trapezoid EFGH ~ trapezoid IJKL

CONCEPT REINFORCEMENT:

MMS9:

PAGE 341: #4, #5 & #9

PAGE 342: #13

PAGE 352: #5(a)

PAGE 377: #6

PAGE 378: #8