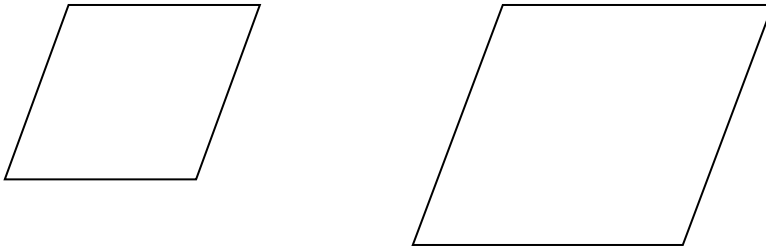Two geometric figures that have exactly the same shape are similar   ~

Definition: Two polygons are similar if and only if two conditions are satisfied:
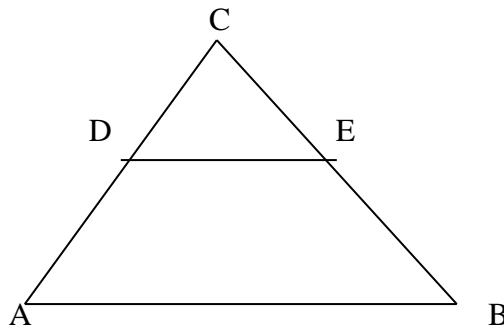
1. All parts of corresponding angles are congruent.
2. All pairs of corresponding sides are proportional.

Example 1: $\triangle ABC \sim \triangle XTN$, $m\angle A = 92°$, $m\angle T = 27°$, find the measures of the other angles.

Example 2: $\triangle ABC \sim \triangle XTN$, if AB = 7, AC = 4, BC = 8 and XT = 10. Find the length of XN and TN.

Example 3: $\triangle ABC \sim \triangle DEC$ and AB || DE, solve for x.   Given: $C = x + 4$, $AD = 9x + 2$, $DE = 9$ and $AB = 48$

Example 4: On a blueprint the length of an 18 foot room is represented by a line segment that is 3.6 inches long. What would a 15 foot room be represented by?

Scale Factor: The ratio of the lengths of two corresponding sides of two similar polygons.
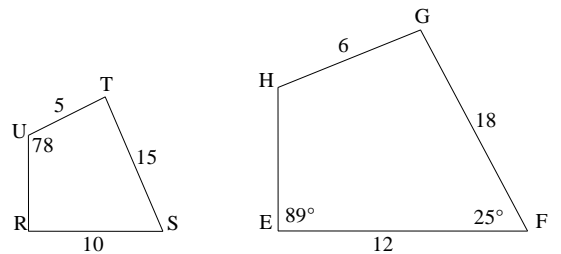
The following quadrilaterals are similar;
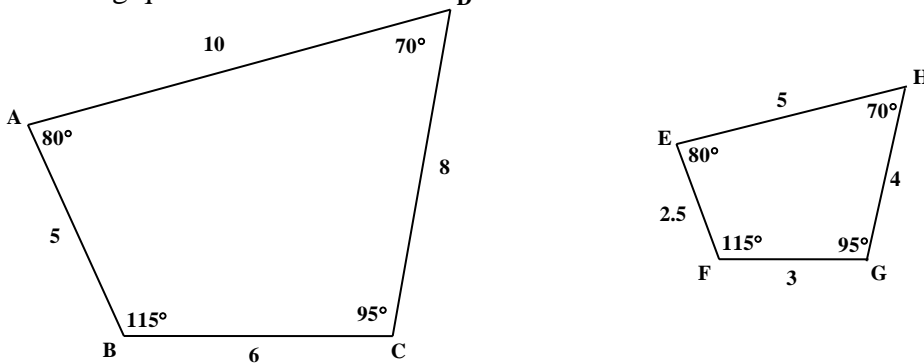
Why are they similar? Because……..

  1) $\angle A \cong \angle E$ $\angle B \cong \angle F$ $\angle C \cong \angle G$ $\angle D \cong \angle H$

  2) $\dfrac{AB}{EF} = \dfrac{BC}{FG} = \dfrac{CD}{GH} = \dfrac{DA}{HE} = \dfrac{2}{1}$ ⟵————This is the scale factor!
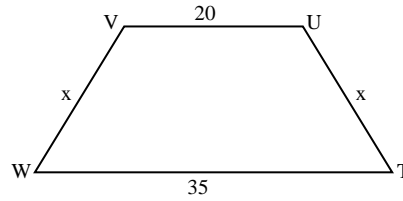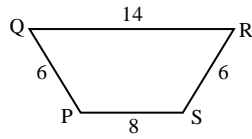
Example 5: Complete each statement: RSTU ~ EFGH

Complete each statement - RSTU ~ EFGH

1. $\angle R =$ _____   2. $\angle S =$ _____

3. $\angle H =$ _____   4. $\angle G =$ _____

5. $\dfrac{HG}{UT} =$ _____   6. $\dfrac{ST}{FG} =$ _____

Example 6: determine the height of the Eiffel Tower if a person is 5.5 feet tall casts a .5 foot shadow and the Eiffel Tower casts a 90 foot shadow at the same time.

Two congruent polygons are also similar.
Question:
Two similar polygons are always congruent, true or false?
Example 7:
Which figures must be similar?

a. Any two isosceles triangles

b. Any two regular pentagons

c. Any two rectangles

d. Any two squares

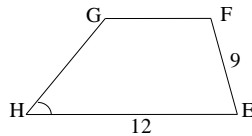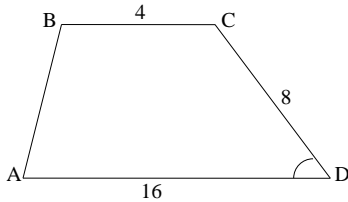Example 8: Trapezoid PQRS is similar to trapezoid UTWV. Find the value of x.

a.   identify the scale factor

b.   UT or x =

Example 9: ABCD ~ EFGH, they are both quadrilaterals.

a.   Find AB.

b.   Find HG.

c.   Find FG.

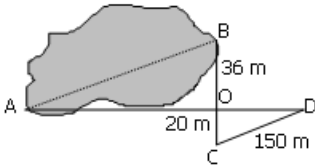Example 10:
ΔABC~ΔDEF. The scale factor of ΔABC to ΔDEF is   3/7. Draw a picture and then complete
each statement.

a.   If AB=15, then DE=

b.   If EF=42, then BC=

c.   If DF=56, then AC=

Example 11: In order to find the distance AB across a lake, a surveyor constructed ΔOCD similar to ΔOBA. He measured OB (36m), OC (20m), and CD (150m) directly to obtain the lengths shown. Find the length of AB.

Example 12: ΔRST ~ ΔRUV find x and y