Geometry Notes S - 1: Similarity

Review

Rigid motion (aka *isometry*): a composition of transformations that

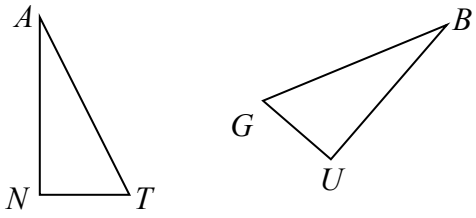
Basic rigid motions:

Major properties: 1.

2.

Congruent: two figures are congruent if

Ex: a. Describe a sequence of basic rigid motions that could show $\Delta ANT \cong \Delta BUG$ (Remember, there is more than one correct answer.)



b. Are the two triangles congruent?

Congruence is nicely defined in terms of rigid motions. But rigid motions are not a convenient method to actually decide if two figures are congruent. So for triangles, we developed some congruence theorems:

$\Delta \cong \Delta$ if:

New

Similarity transformation: a composition of transformations that

Ex: ΔABC has $AB = 12$ and $BC = 18$.

a. After the transformation T, $A'B' = 18$ and $B'C' = 24$. Is T a similarity transformation?

b. After the transformation S, $A'B' = 8$ and $B'C' = 12$. Is S a similarity transformation?

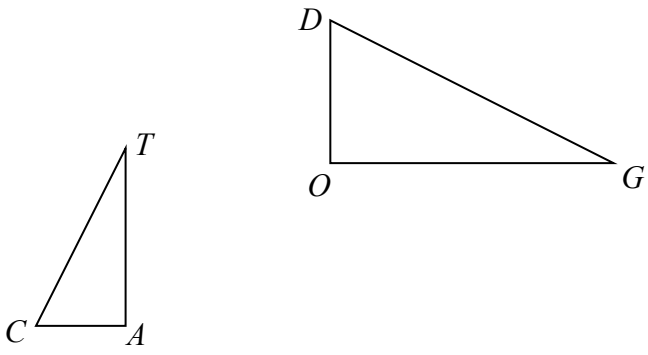
Which of the basic transformations we learned are similarity transformations?

Major properties: 1.

2.

Similar: two figures are similar if

Ex: a. Describe a similarity transformation that could show $\Delta CAT \sim \Delta DOG$ (Note: There is more than one correct answer.)



b. Are the two triangles similar?

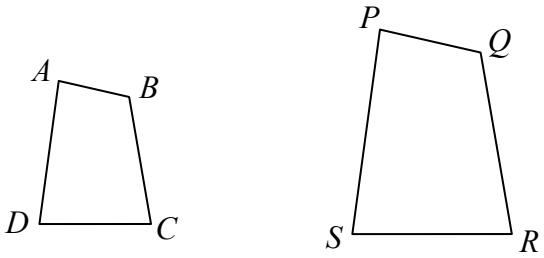
Properties of similar polygons:

a. All pairs of corresponding (matching) angles are

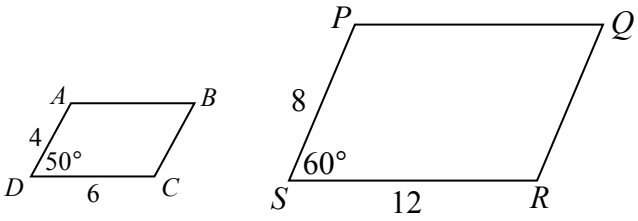
b. All pairs of corresponding (matching) sides are

NOTE: Just like for congruent polygons, similarity statements are written so that corresponding vertices are in the ***same order.***

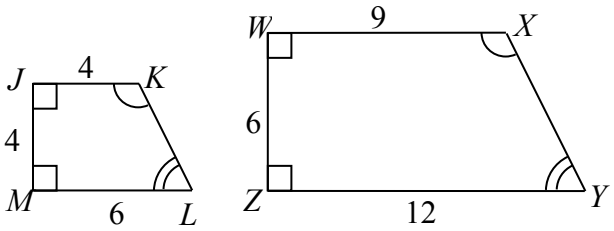
Ex: If $ABCD \sim PQRS$, then



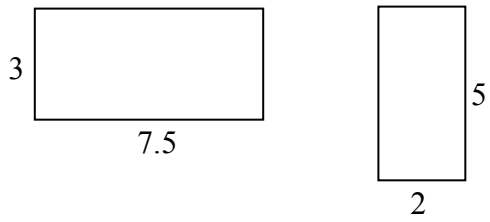
Ex: Is $ABCD \sim PQRS$?



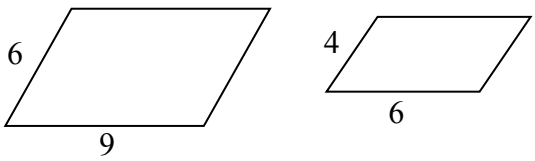
Ex: Is $ABCD \sim PQRS$?



Ex: a. Are the two rectangles shown similar?



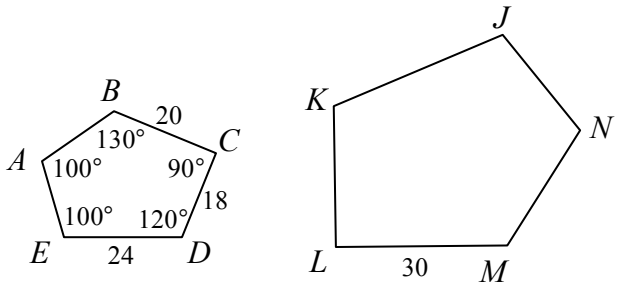
b. Are the two parallelograms shown similar?



Ex: In the diagram, $ABCDE \sim JKLMN$

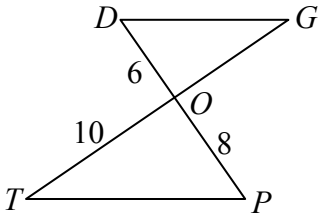
a. Find $m\angle K$.

b. Find MN.

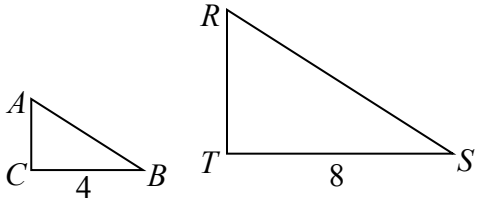


Geometry HW: Similarity - 1

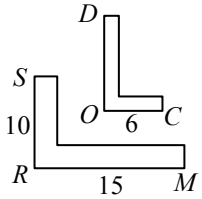
1. The two triangles shown at right are similar.
   a. Complete the similarity statement: _____ ~ Δ*DOG*
   b. Describe a similarity transformation that would take the first triangle onto the second.



2. Assuming they are similar, describe a similarity transformation that would take Δ*ABC* onto Δ*RST*.



3. a. Assuming the figures at right are similar, describe a similarity transformation that would take the smaller figure onto the larger onto the larger.



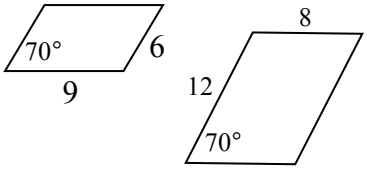
   b. Find the length of $\overline{DO}$.

4. Explain why not all rectangles are similar and draw a diagram to illustrate.

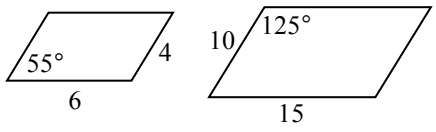
5. Explain why not all rhombuses are similar and draw a diagram to illustrate.

6. Are all squares similar? Why or why not?

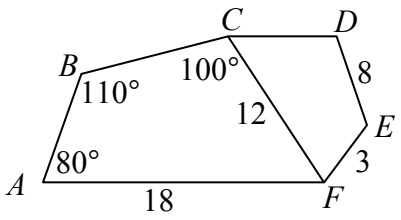
7. Are the two parallelograms at right similar? Justify your answer.



8. Are the two parallelograms at right similar? Justify your answer.



9. In the diagram at right, quadrilateral $ABCF \sim FEDC$.
   a. Find $m\angle AFC$.
   b. Find $m\angle E$.
   c. Find the length of $\overline{AB}$.
   d. Find the length of $\overline{CD}$.



10. Arka Tek has a proposal for a new skyscraper. She has made a scale model of her design; the long side of the base of her model measures 18 inches and the model is 68 inches high. Ms. Tek envisions the actual building having a long base of 432 feet. How high will it be?

11. ΔABC is similar to ΔDEF and the ratio of similarity of the triangles is 5:4.
   a. If $AB = 15$, find DE.
   b. If $m\angle A = 50°$, find $m\angle D$.