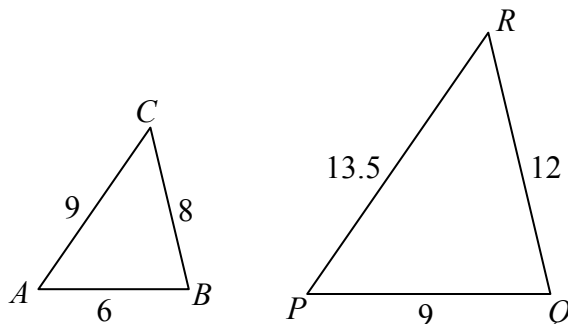# Geometry Notes S - 3: Proving Triangles Similar II

Theorem: If all three corresponding pairs of sides of two triangles are in proportion, then the triangles are similar. (Corresponding angles will automatically be congruent.)

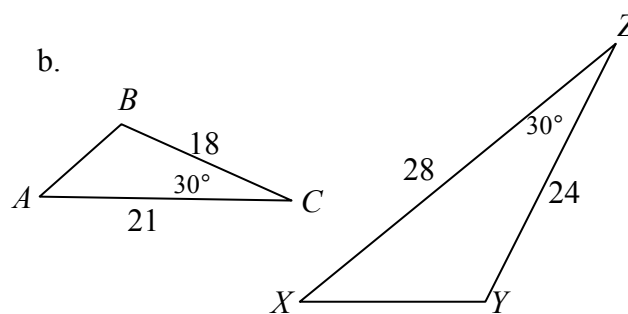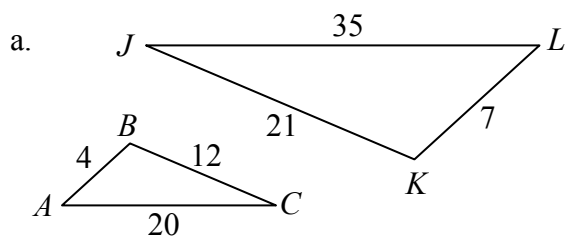Ex: Show the triangles at right are similar.

Theorem: If one pair of corresponding angles of two triangles is congruent and the sides that include those angles are in proportion, then the triangles are similar. (The other two pairs of corresponding angles will be congruent and the third pair of sides will be in proportion.)

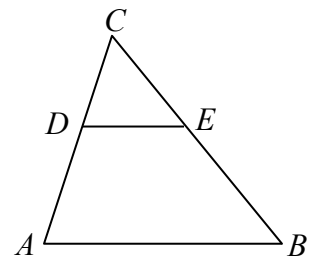Ex: Show the triangles at right are similar.
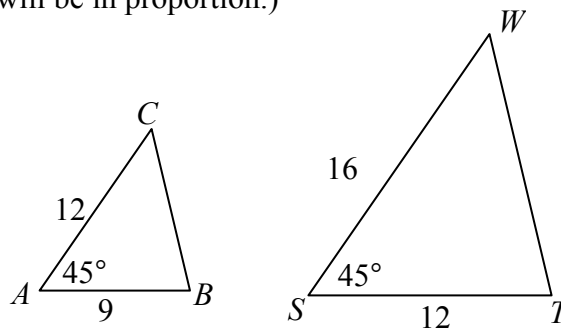
Ex: Determine if the two triangles are similar.

a.

b.

Ex: Given: $\triangle ABC$, D divides $\overline{CA}$ in the ratio
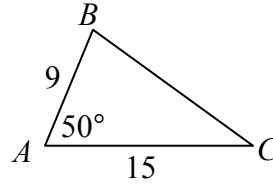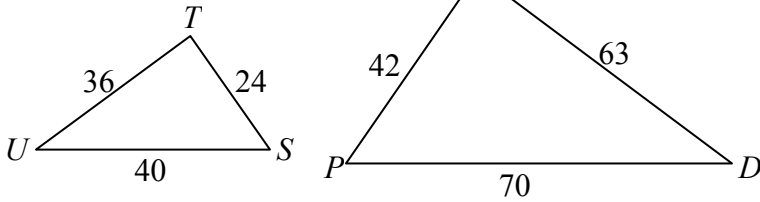3:5 and E divides $\overline{CB}$ in the ratio 3:5.
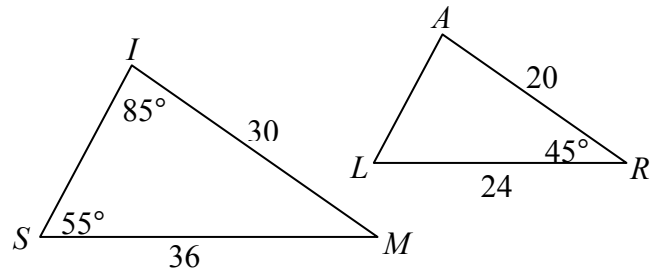
a. Prove: $\triangle DEC \sim \triangle ABC$.

b. If $DE = 12$, find AB.
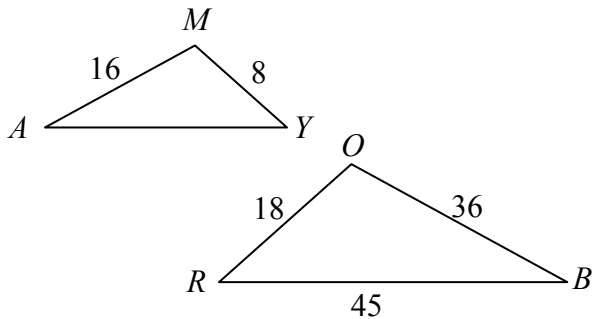
Geometry HW: Similarity - 3

1. Determine if the two triangles shown at right are similar and justify your answer.

2. Determine if the two triangles shown at left are similar and justify your answer.

3. Determine if the two triangles shown at right are similar and *justify your answer*.


4. a. In the diagram at left, what must be the length of $\overline{AY}$ if the two triangles are to be similar?
    b. Will having AY be the value you found above be enough to prove the triangles are similar? Justify your answer.

5. Given: $\overline{ABC}$
   a. If $AB:BC = 2:3$, find $AB:AC$.
   b. If $AB:BC = x:y$, find $AB:AC$.

6. Given: $\triangle ABC$, P divides $\overline{CA}$ in the ratio 3:5 and Q divides $\overline{CD}$ in the ratio 3:5.
   a. Explain why $\triangle PQC \sim \triangle ABC$.
   b. Explain why $\overline{PQ} \, \text{P} \, \overline{AB}$
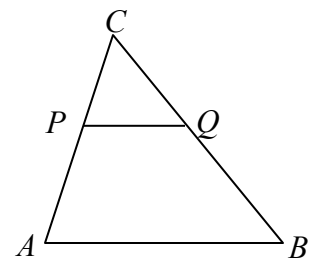
7. The ratio of similarity of two similar pentagons is 3:2. If a side in the larger pentagon measures 24, find the measure of the corresponding side in the smaller pentagon.
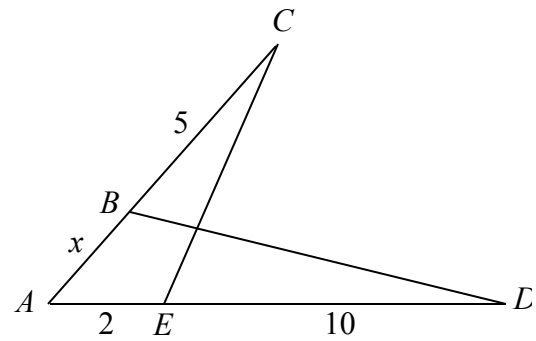
8. In the diagram at right, $\angle C \cong \angle D$.
   a. Write a similarity statement for two triangles and justify why they are similar.
   b. Find the numerical value of AB.