Geometry Notes S - 2: Proving Triangles Similar

Review: Two figures are similar if

In similar figures,

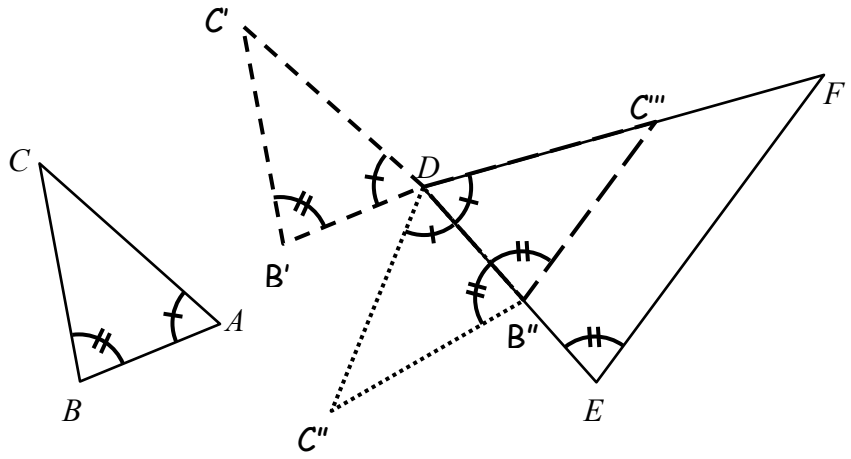
1. All pairs of corresponding angles are
2. All pairs of corresponding sides are

Similar Triangles

Theorem: If two angles of one triangle are congruent to two angles of a second triangle, then the triangles are similar.

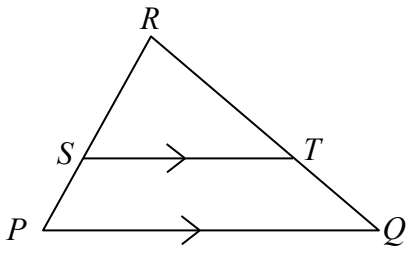
Given: ΔABC and ΔDEF
$\angle A \cong \angle D$, $\angle B \cong \angle E$

Show via a similarity transformation that $\Delta A'B'C' \sim \Delta ABC$.

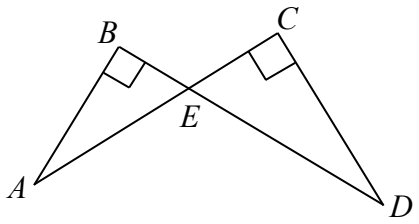


Ex: Write a similarity statement and give a reason why the triangles are similar.

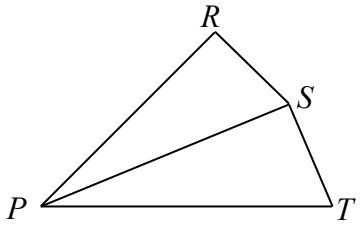
a.



b.



Ex: Given: $\overline{PR} \perp \overline{RS}$, $\overline{PS} \perp \overline{ST}$, $\overline{PS}$ bisects $\angle RPT$.



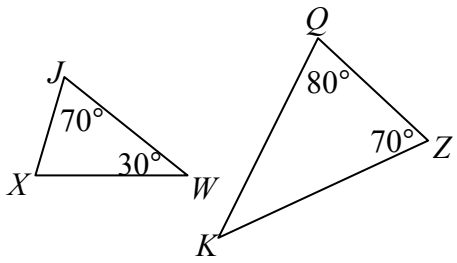
a. Prove: $\Delta PRS \sim \Delta PST$.

Statement	Reason

b. If $PR = 9$ and $PS = 10$, find PT.

Geometry HW: Similarity - 2

1. Are the triangles at right similar? Justify your answer.



2. Are all equilateral triangles similar? Justify your answer.

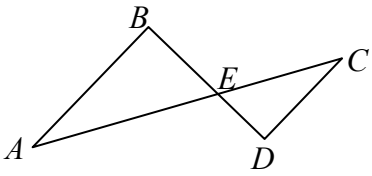
3. Are all isosceles triangles similar? Justify your answer.

4. Are all right triangles similar? Justify your answer.

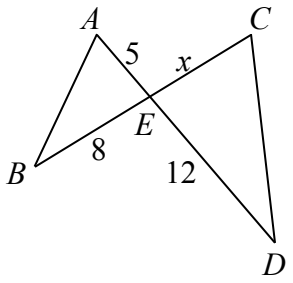
5. Are all isosceles right triangles similar? Justify your answer.

6. Given: Trapezoid $ABCD$ with $\overline{AB} \parallel \overline{CD}$, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.
   a. Draw a diagram.
   b. Prove: $\Delta ABE \sim \Delta CDE$
   c. If $AE = 3$, $BE = 4$ and $DE = 6$, find the value of CE.

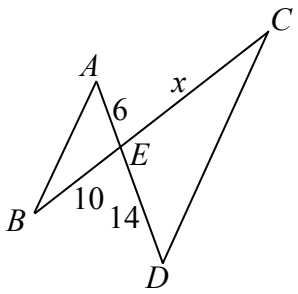
7. a. Given: $\overline{AEC}$ and $\overline{BED}$, $\overline{AFEC}$, $\overline{AB} \perp \overline{BD}$, $\overline{CD} \perp \overline{BD}$
   Prove: $\Delta ABE \sim \Delta CDE$
   b. If $m\angle A = 28°$, find $m\angle DEC$.
   c. If $AB = 60$, $BE = 32$ and $CE = 51$, find CD and DE.



8. In the diagram at right, $\Delta ABE \sim \Delta CDE$. Find the value of x.



9. In the diagram at right, $\Delta ABE \sim \Delta DCE$. Find the value of x.



10. Given: ΔABC, P on $\overline{CA}$ and Q on $\overline{CB}$ so that $\overline{PQ} \parallel \overline{AB}$.
    a. Prove: $\Delta PQC \sim \Delta ABC$.
    b. If $CP = 6$, $CQ = 8$ and $CA = 15$, find CB.
    c. Find the following ratios: CP:PA, CQ:QB and PQ:AB. Are any of the ratios the same?

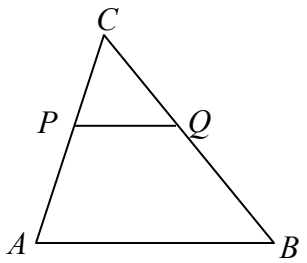


Diagram for #7 and #8.

11. While solving for x in the diagram at right, Rufus wrote $\frac{6}{8} = \frac{5}{x}$ (these are called between-figure ratios). Goofus wrote $\frac{6}{5} = \frac{8}{x}$ (these are called within-figure ratios). Who got the right answer? What is the point of this question?