

Name: Kelly

Date: _____

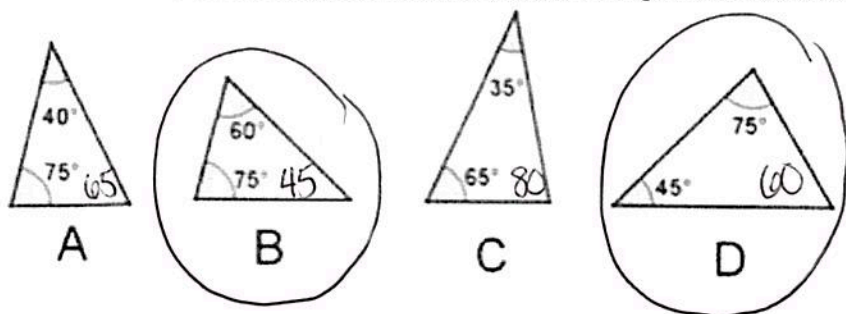
UNIT 5

LESSON 9

AIM: WHAT ARE THE TRIANGLE SIMILARITY THEOREMS (AA, SAS, SSS)?

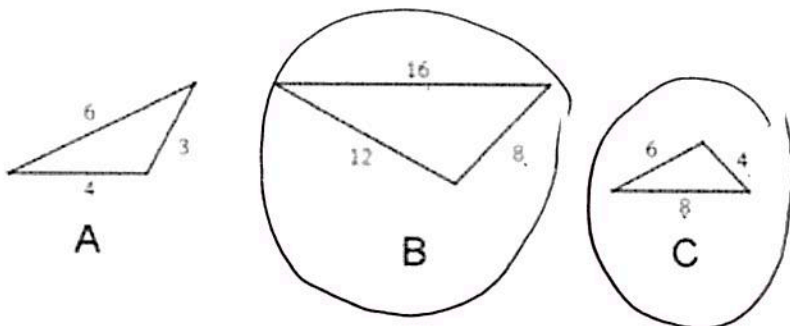
Do Now: For each of the following, circle which pairs of triangles are similar. Justify your answer.

1.



Find missing \angle 's!
 B & D are similar
 b/c their \angle 's are
 \cong !

2.



LOOK for scale factor
 B & C are similar
 b/c they share the
 same scale factor
 of 2.

SIMILARITY THEOREMS

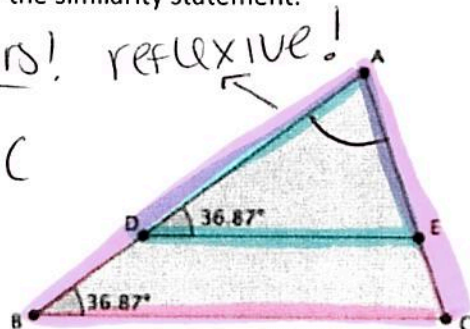
THEOREM #1:

Angle Angle Similarity Theorem- two triangles are similar if two angles of one triangle are congruent to two corresponding angles of the other triangle.

If 2 \angle 's are \cong , the third will also have to be \cong !

EXAMPLE: Are the triangles below similar? Explain why or why not. Then, write the similarity statement.

Yes, $\triangle ADE \sim \triangle ABC \rightarrow$ order matters! reflexive!
 by AA \cong AA $\rightarrow \angle ADE \cong \angle ABC$
 and $\angle A \cong \angle A$

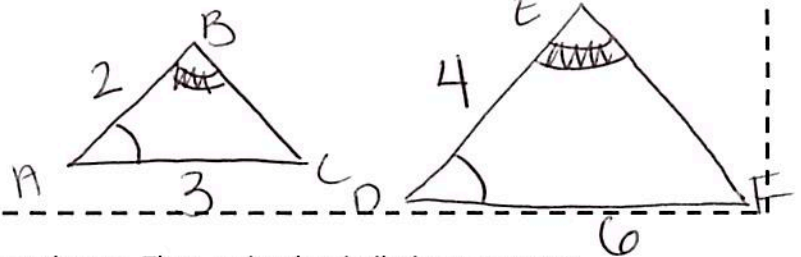


THEOREM #2:

Side - Angle - Side

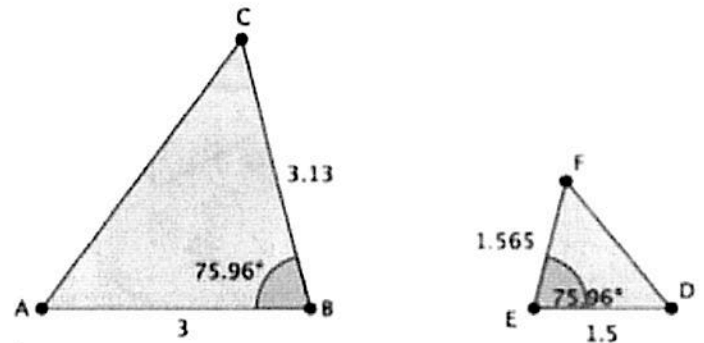
Similarity Theorem- two triangles are similar if an angle of one triangle is congruent to the corresponding angle of another triangle and the lengths of the sides including these angles are in proportion, the triangles are similar.

$\frac{2}{4} = \frac{1}{2} \checkmark$
 $\frac{3}{6} = \frac{1}{2} \checkmark$
 $\angle A \cong \angle E$
 $\Delta ABC \sim \Delta DEF$ by SAS



EXAMPLE: Are the triangles below similar? Explain why or why not. Then, write the similarity statement.

$\frac{3}{1.5} = 2 \checkmark$
 $\angle B \cong \angle E$
 $\frac{3.13}{1.565} = 2 \checkmark$



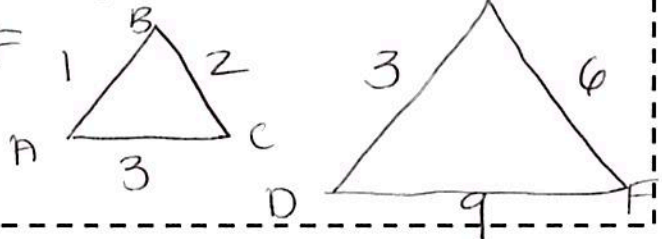
yes, $\Delta ABC \sim \Delta DEF$ by SAS

THEOREM #3:

Side - Side - Side

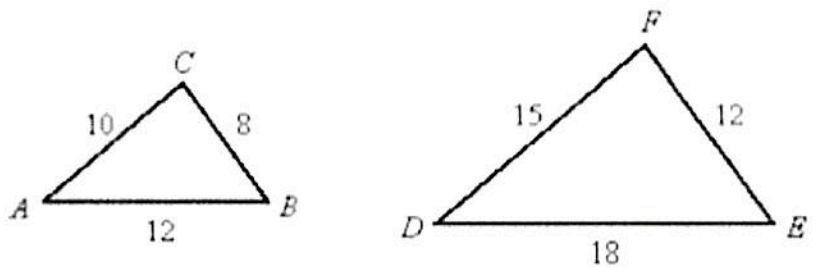
Similarity Theorem- two triangles are similar if the lengths of the corresponding sides of two triangles are proportional, then the triangles must be similar.

$\frac{1}{3} \checkmark$
 $\frac{2}{6} = \frac{1}{3} \checkmark$
 $\frac{3}{9} = \frac{1}{3} \checkmark$
 $\Delta ABC \sim \Delta DEF$ by SSS



EXAMPLE: Are the triangles below similar? Explain why or why not. Then, write the similarity statement.

$\frac{10}{15} = \frac{2}{3} \checkmark$
 $\frac{8}{12} = \frac{2}{3} \checkmark$
 $\frac{12}{18} = \frac{2}{3} \checkmark$



yes $\Delta ACB \sim \Delta DFE$ by SSS

PRACTICE:

When in doubt, sketch it out!

1. In triangles ABC and DEF , $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

1) AA
 2) SAS
 3) SSS
 4) ASA

2. In $\triangle ABC$ and $\triangle DEF$, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

1) $AC = DF$
 2) $CB = FE$
 3) $\angle ACB \cong \angle DFE$
 4) $\angle BAC \cong \angle EDF$

need included \angle 's

3. State if the triangles in each pair are similar. If so, state how you know they are similar.

A) not similar
 B) similar; AA similarity
 C) similar; SAS similarity
 D) similar; SSS similarity

no sides to compare
 vertical \angle 's!
 $\times 5!$

4. State if the triangles in each pair are similar. If so, state how you know they are similar.

A) not similar
 B) similar; AA similarity
 C) similar; SAS similarity
 D) similar; SSS similarity

reflex \angle 's

S | $\frac{140}{680} = \frac{7}{34} \checkmark$
 A | $\angle V \cong \angle V \checkmark$
 S | $\frac{266}{1292} = \frac{7}{34} \checkmark$

5. State if the triangles in each pair are similar. If so, state how you know they are similar.

A) not similar
 B) similar; AA similarity
 C) similar; SAS similarity
 D) similar; SSS similarity

corresponding \angle 's are not \cong !

6. State if the triangles in each pair are similar. If so, state how you know they are similar.

A) not similar
 B) similar; AA similarity
 C) similar; SAS similarity
 D) similar; SSS similarity

S | $\frac{462}{1034} = \frac{21}{47} \checkmark$
 S | $\frac{714}{1598} = \frac{21}{47} \checkmark$
 S | $\frac{945}{2115} = \frac{21}{47} \checkmark$

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UNIT 5

LESSON 9

HOMWORK

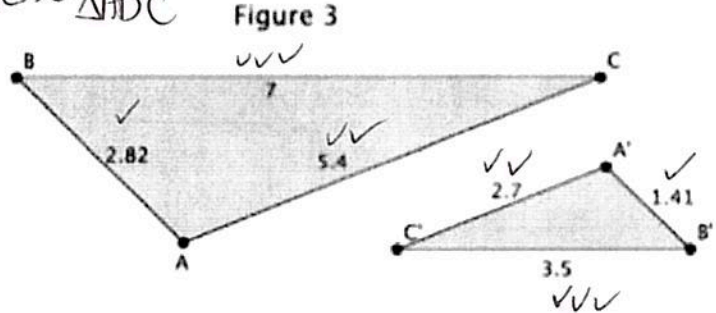
1. Examine the figure and answer the questions to determine whether or not the triangles shown are similar. What can you conclude about the relationship between $\triangle ABC$ and $\triangle A'B'C'$. Explain your reasoning.

$$S \left| \frac{1.41}{2.82} = 0.5 \checkmark \right.$$

$$S \left| \frac{2.7}{5.4} = 0.5 \checkmark \right.$$

$$S \left| \frac{3.5}{7} = 0.5 \checkmark \right.$$

yes, $\triangle ABC \sim \triangle A'B'C'$
by SSS \sim



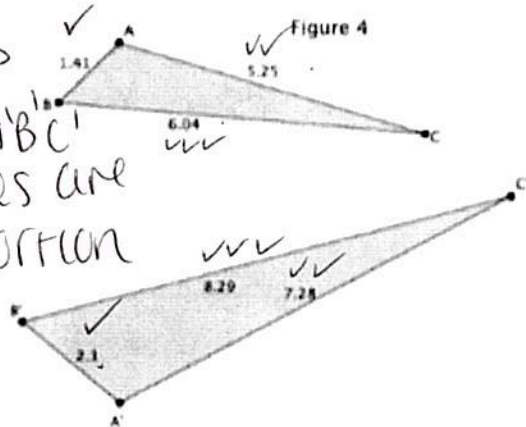
2. Examine the figure and answer the questions to determine whether or not the triangles shown are similar. What can you conclude about the relationship between $\triangle ABC$ and $\triangle A'B'C'$. Explain your reasoning.

$$S \left| \frac{1.41}{2.1} = 0.6714 \times \right.$$

$$S \left| \frac{5.25}{7.28} = 0.7211 \times \right.$$

$$S \left| \frac{6.04}{8.29} = 0.7285 \times \right.$$

NO, $\triangle ABC$ is not \sim to $\triangle A'B'C'$
b/c the sides are not in proportion



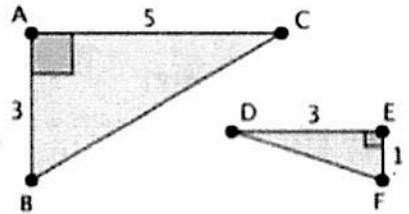
3. Are the triangles shown below similar? Explain. If the triangles are similar, write the similarity statement.

$$S \left| \frac{3}{1} = 3 \times \right.$$

$$A \left| \angle A \cong \angle E \checkmark \right.$$

$$S \left| \frac{5}{3} = 1.6 \times \right.$$

NO, $\triangle ABC$ is not \sim to $\triangle DEF$ b/c the sides are not in proportion



4. Are the triangles shown below similar? Explain. If the triangles are similar, write the similarity statement.

$$S \left| \frac{2.24}{4.48} = 0.5 \checkmark \right.$$

$$A \left| \angle AEB \cong \angle DEC \checkmark \right.$$

$$S \left| \frac{3.16}{6.32} = 0.5 \checkmark \right.$$

yes, $\triangle AEB \sim \triangle DEC$
by SAS \sim

