

LESSON 4: THE HINGE THEOREM AND ITS CONVERSE



I. OBJECTIVES

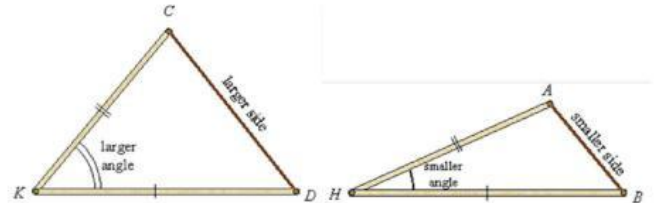
The learner illustrates theorems on triangle inequalities (Exterior Angle Inequality Theorem, Triangle Inequality Theorem, Hinge Theorem). **M8GE-IVa-1**

- The learner compares two triangles using the Hinge theorem and its converse.



II. LESSON

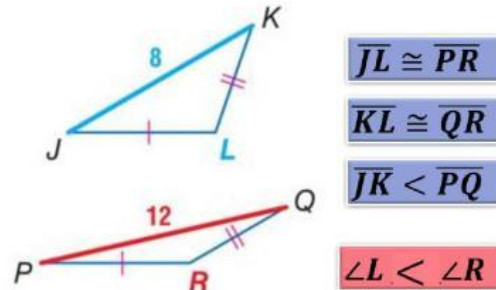
Hinge Theorem If two sides of one triangle are congruent respectively to two sides of a second triangle, and the included angle of the first triangle is larger than the included angle of the second, then the third side of the first triangle is longer than the third side of the second.



Congruent sides: $KC \cong HA$
 $KD \cong HB$

If $m\angle K > m\angle H$, then $CD > AB$.

Converse of Hinge Theorem If two sides of one triangle are congruent to two sides of another triangle, but the third side of the first triangle is longer than the third side of the second, then the included angle of the first triangle is larger than the included angle of the second.



$JL \cong PR$

$KL \cong QR$

$JK < PQ$

$\angle L < \angle R$



III. ACTIVITY

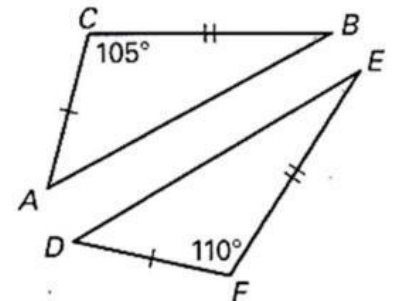
I. Given the two triangles, $\triangle ABC$ and $\triangle DEF$ answer the following questions.

1. Which side is congruent to \overline{AC} ?

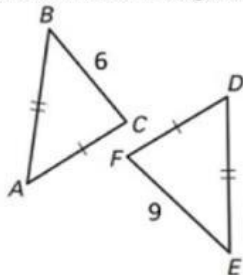
2. Which side is congruent to \overline{CB} ?

3-4. Complete the statement by writing $>$, $<$, or $=$.

If $\angle C$ $\angle F$, then \overline{AB} \overline{DE}



II. Given the two triangles, $\triangle ABC$ and $\triangle DEF$ answer the following questions.



1. Which side is congruent to \overline{DE} ?

2. Which side is congruent to \overline{DF} ?

3-4. Complete the statement by writing $>$, $<$, or $=$.

If \overline{EF} \overline{BC} , then $\angle D$ $\angle A$



I NEED MORE HELP!

I'M GETTING IT!

I GOT IT!

