

TOPIC: 5.6 Inequalities in Two Triangles

NAME: Mrs. Hutch

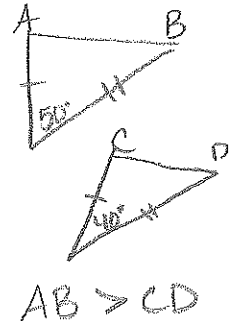
DATE: (KEY)

ESSENTIAL QUESTION: Given 2 \cong sides in 2 Δ s how do you know in which Δ the 3rd side is larger

QUESTIONS:

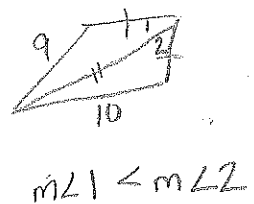
Theorem 5.13: Hinge Theorem

If two sides of a triangle are congruent to two sides of another triangle and the included angle of the first is larger than the included angle of the second, then the 3rd side of the first Δ is longer than the 3rd side of the 2nd Δ .

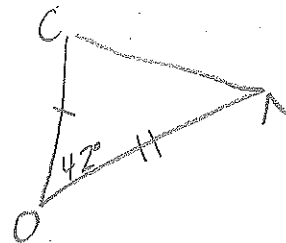
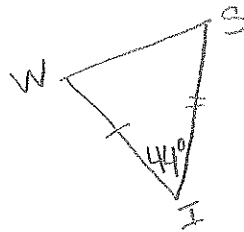


Theorem 5.14: Converse of the Hinge Theorem

If two sides of a triangle are congruent to two sides of another triangle and the third side of the first is longer than the third side of the second, then the included angle of the first Δ is larger than the included angle of the 2nd Δ .



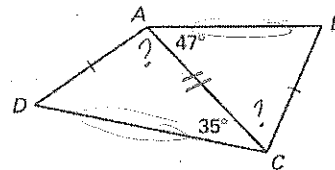
A1. Sketch ΔWIS and ΔCON implementing the Hinge Theorem.



$WS > CN$

A2. Explain why the student's reasoning was incorrect.

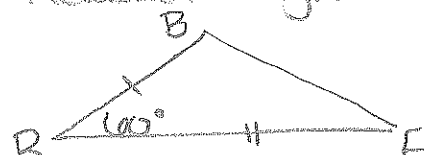
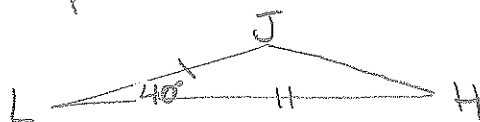
The included \angle s are still unknown \therefore no conclusion can be made



By the Hinge Theorem, $AB > DC$.

SUMMARY:

Given 2 Δ 's w/ 2 \cong sides, the larger 3rd side corresponds to the largest included angle.



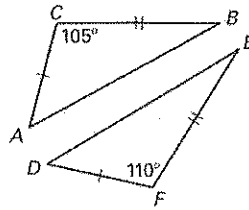
$40^\circ < 60^\circ$

$JH < BE$

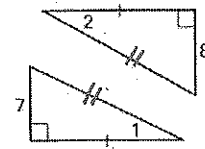
QUESTIONS:

A3. Complete with $<$, $>$, or $=$. Explain what theorem was applied.

a. $AB < DE$ Hinge Thm

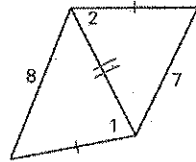


b. $m\angle 1 < m\angle 2$



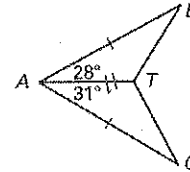
Hinge Thm
Converse

c. $m\angle 1 > m\angle 2$



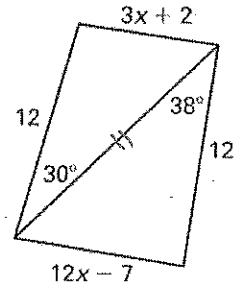
Hinge Thm
Conv.

d. $TG > TE$



Hinge Thm.

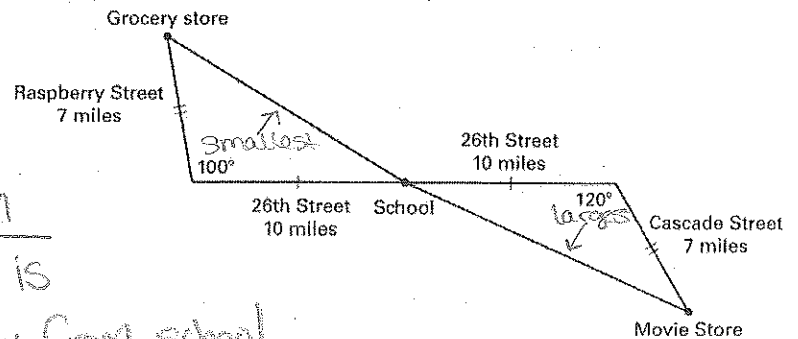
A4. Use the Hinge Theorem or its converse and properties of triangles to write and solve an inequality to describe a restriction on the value of x .



$$\begin{aligned} 3x+2 &< 12x-7 \\ +7 & \quad -3x \\ \hline 9 &< 9x \\ 1 &< x \end{aligned}$$

$x > 1$

A5. You and a friend are going shopping. You leave school and drive 10 miles due west on 26th Street. You then drive 7 miles northwest on Raspberry Street to the grocery store. Your friend leaves school and drives 10 miles east on 26th Street. He then drives 7 miles southeast on Cascade Street to the movie store. Each person has driven 17 miles. Use the map below with its additional information to determine which of you is farthest from your school? Explain.



By Hinge Thm
your friend is
further away from school
because $100^\circ < 120^\circ$