Pop Quiz.
Get out a scrap sheet of paper.

Matching! Match the correct description with each definition.

1. Point of concurrency of the medians of a Δ.

2. Point of concurrency of the altitudes of a Δ.

3. A segment from the vertex to the midpoint of the opposite side.

4. A $\perp$ segment from the vertex to the opposite side.

A. Median

B. Orthocenter

C. Altitude

D. Centroid

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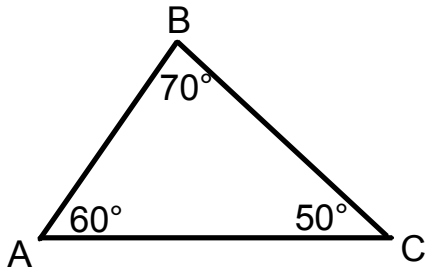
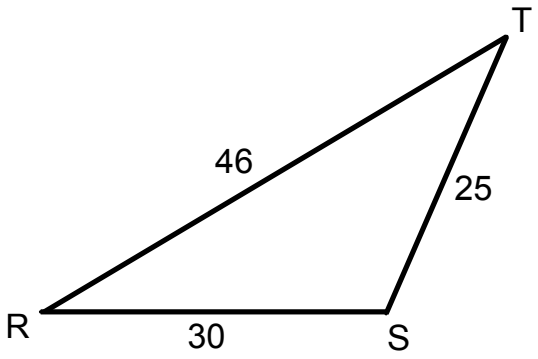
Bellwork
11/18/2011

For problems 1 and 2, list the sides or angles in order from least to greatest.

1.



2.



Geometry
5.6 Inequalities in Two Triangles and Indirect Proof
Standard(s): 7

Vocabulary:

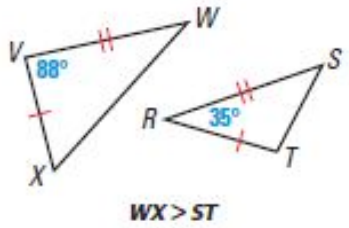
1. **Indirect Proof (proof by contradiction):**
   1) Assume temporarily what you want to prove is false.
   2) Reason logically until you reach a contradiction.
   3) Point out that the desired conclusion must be true because the contradiction proves the temporary assumption false.

THEOREMS *For Your Notebook*

THEOREM 5.13 Hinge Theorem

If two sides of one 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 third side of the first is longer than the third side of the second.

Proof: Ex. 28, p. 341

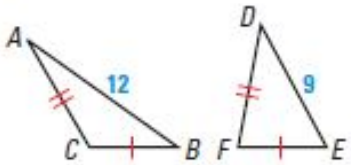


$WX > ST$

THEOREM 5.14 Converse of the Hinge Theorem

If two sides of one 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 is larger than the included angle of the second.

Proof: Example 4, p. 338



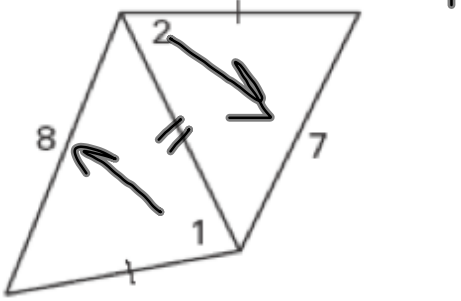
$m\angle C > m\angle F$

Complete a Statement Using Hinge Thm.

Complete the statement with >, <, or =.

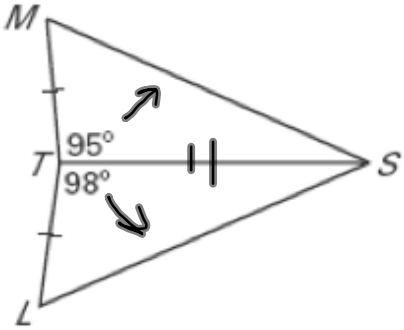
$m\angle 1 ____ m\angle 2$

$m\angle 2 < m\angle 1$



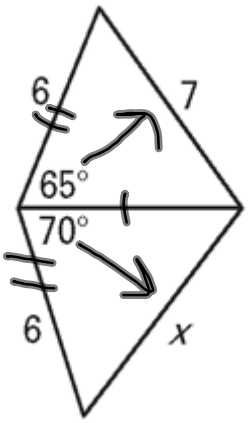
$MS ____ LS$

$MS < LS$

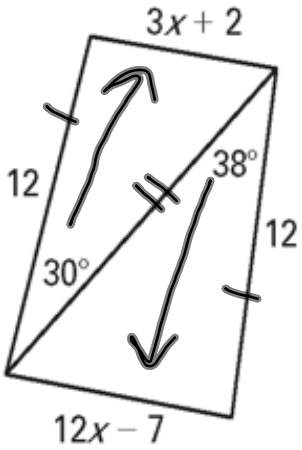


Use the Hinge Theorem Algebraically

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.*



$x > 7$



$12x - 7 > 3x + 2$

$9x - 7 > 2$

$9x > 9$

$x > 1$

Starting an Indirect Proof

Write a temporary assumption you could make to prove the conclusion indirectly.

In $\triangle MNO$, if $\overline{MP}$ is perpendicular to $\overline{NO}$, then $\overline{MP}$ is an altitude.

GIVEN: $\overline{MP} \perp \overline{NO}$

PROVE: $\overline{MP}$ is an altitude.

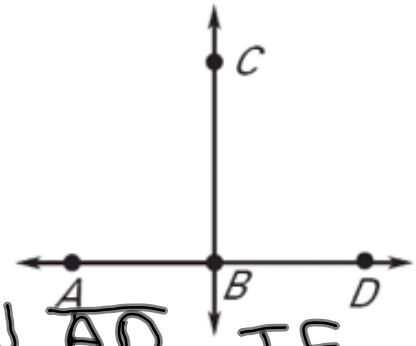
Assume... temporarily $\overline{MP}$ is not an altitude.

Indirect Proof

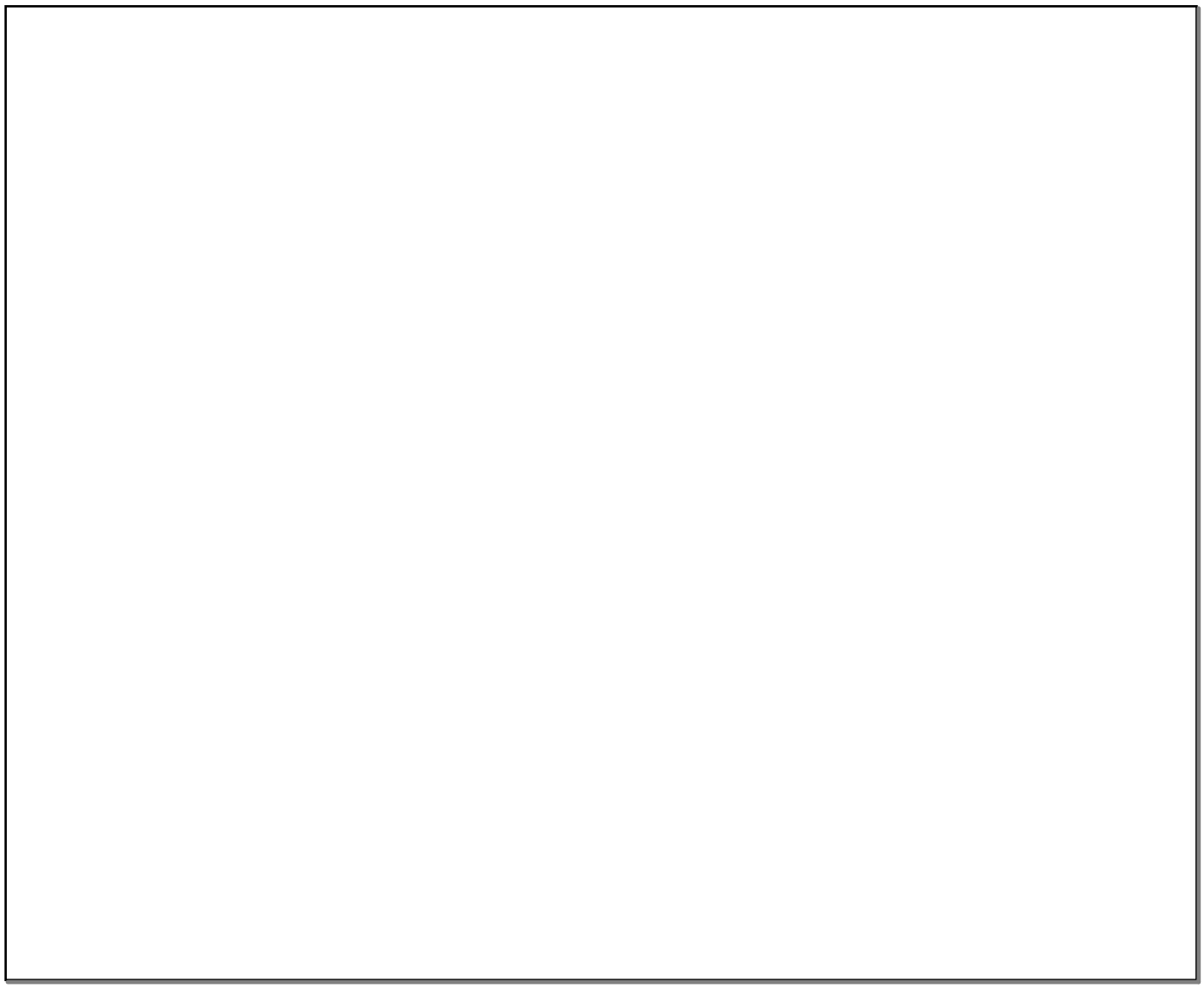
Write an indirect proof.

Given: $\angle ABC \ncong \angle DBC$

Prove: $BC \perp AD$



Temporarily assume $\overline{BC} \perp \overline{AD}$. If $\overline{BC} \perp \overline{AD}$, then $\angle ABC$ & $\angle DBC$ are right $\angle$'s by the def. of $\perp$ lines. Then, $\angle ABC \cong \angle DBC$ by the right $\angle \cong$ thm. But, we're given that $\angle ABC \ncong \angle DBC$. So, $\overline{BC} \not\perp \overline{AD}$.

Homework Assignment

Worksheet 5.6B