**Theorem 5-13: SAS Inequality (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.

**Theorem 5-14: SSS Inequality**

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.
5.6 Inequalities Involving Two Triangles (work).

**Example 1:** Complete with $<$, $>$, or $\leq$, $\geq$. Name the theorem used.

- **a)** $m\angle 1 \leq m\angle 2$
- **b)** $NP \geq KL$
- **c)** $DC \leq FE$

**Example 2:** Compare with $<$, $>$, or $\leq$, $\geq$. Name the theorem used.

- **a)** $m\angle AED, m\angle DEF$
  - $SSS$ ineq.
  - $m\angle AED \geq m\angle DEF$

- **b)** $DE, EC$
  - $SAS$ ineq.
  - $DE \geq EC$
Example 3: Compare with <, >, or =. Name the theorem used.

a) $\angle ADC$, $\angle ADB$

SSS Ineq.

$m \angle ADC \leq m \angle ADB$

b) $\angle AFB$, $\angle BFD$

SSS Ineq.

$m \angle AFB \geq m \angle BFD$

Example 4: Use an inequality to describe a restriction on the value of $x$.

a) $x > 9$

b) $x + 3 < 3x + 1$

$\frac{-x}{-1} < \frac{3}{-1}$

$\frac{2}{-2} < \frac{2x}{2}$

$1 < x$

$x > 1$
WORKSHEET

1) \( m \angle 1, m \angle 2 \)

2) \( m \angle 1, m \angle 2 \)

3) \( \overline{XB}, \overline{ZB} \)

SSS Ineq.
\( m \angle 1 \not> m \angle 2 \)

SSS Ineq.
\( m \angle 1 \not> m \angle 2 \)

SAS Ineq.
\( XB \not< ZB \)

WORKSHEET

4) \( \overline{HJ}, \overline{KP} \)

5) \( m \angle 1, m \angle 2 \)

6) \( m \angle 3, m \angle 4 \)

SAS Ineq.
\( HJ \not> KP \)

SSS Ineq.
\( m \angle 1 \not< m \angle 2 \)

SSS Ineq.
\( m \angle 3 \not< m \angle 4 \)
7) $m\angle PRQ, m\angle PRS$

8) $\overline{FH}, \overline{GE}$

SAS Ineq.: $FH > GE$

9) $\overline{KP}, \overline{KG}$

SAS Ineq.: $KP > KG$

SSS Ineq.: $m\angle PRQ < m\angle PRS$