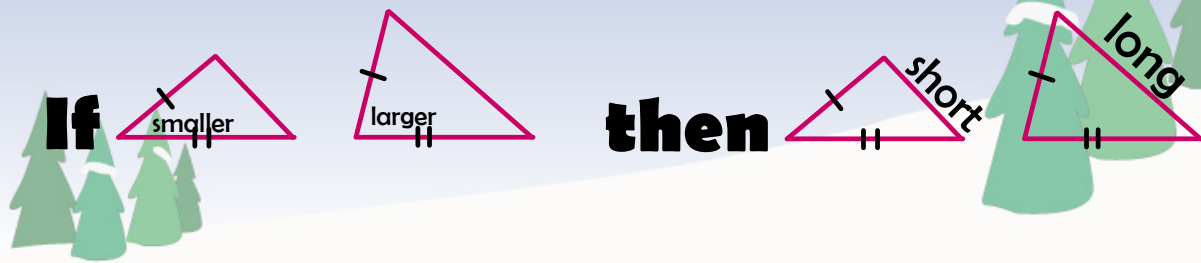


INEQUALITIES INVOLVING TWO TRIANGLES

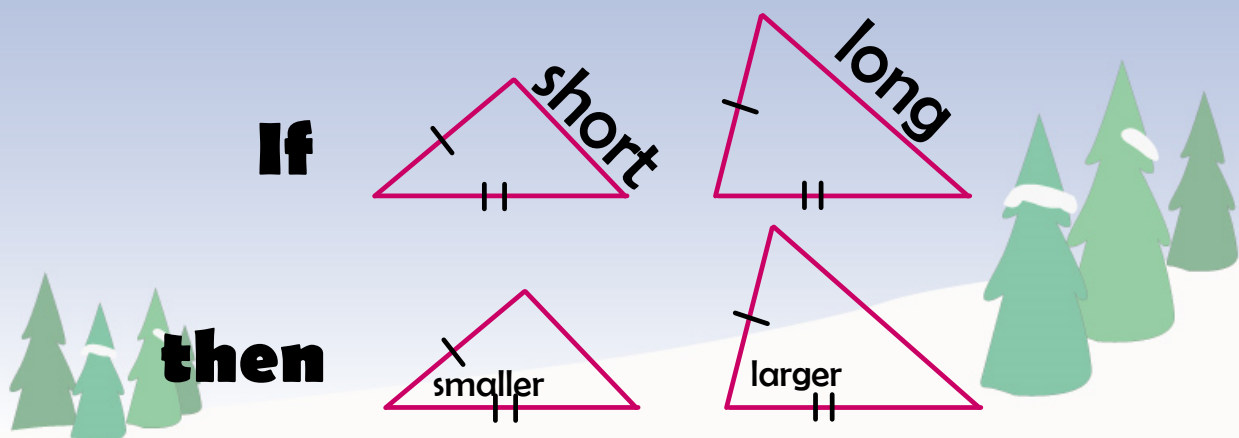
Theorem 5-13: $\$A\$$ Inequality (Hinge Theorem)

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.

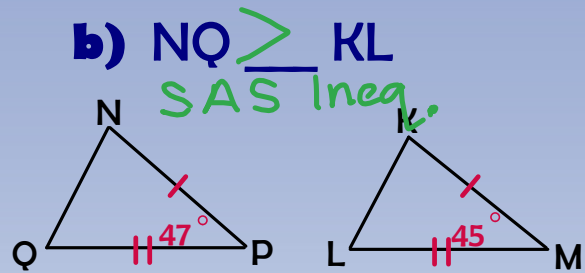
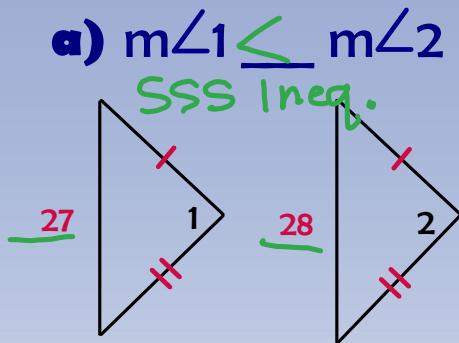


Theorem 5-14: $\$SS\$$ Inequality

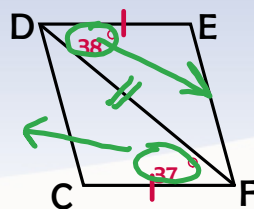
If two sides of one triangle are congruent to two sides of another triangle, and the third side of the first is longer than the third side of the second, then the included angle of the first is larger than the included angle of the second.



Example 1: Complete with $<$, $>$, or $=$.
Name the theorem used.

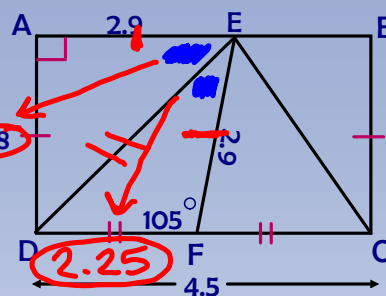


c) $DC < FE$ SAS Ineq.

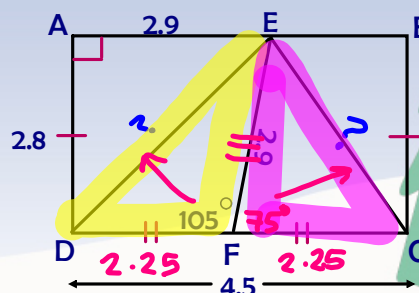


Example 2: Compare with $<$, $>$, or $=$.
Name the theorem used.

a) $m\angle AED, m\angle DEF$
 $m\angle AED > m\angle DEF$
SSS Ineq.



b) DE, EC
 $DE > EC$
SAS Ineq.

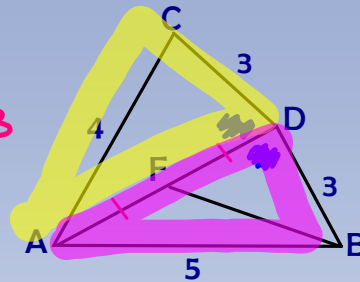


Example 3: Compare with $<$, $>$, or $=$.
Name the theorem used.

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

$$m\angle ADC < m\angle ADB$$

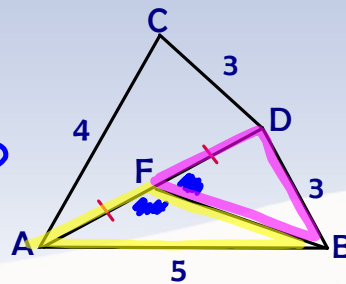
SSS Ineq.



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

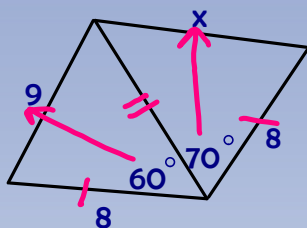
$$m\angle AFB > m\angle BFD$$

SSS Ineq.



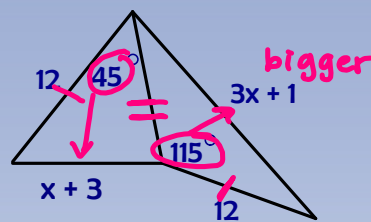
Example 4: Use an inequality to describe a restriction on the value of x .

a)



$$x > 9$$

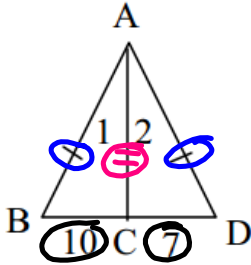
b)



$$\begin{array}{r} 3x+1 > x+3 \\ -x \quad -x \\ \hline 2x+1 > 3 \\ -1 \quad -1 \\ \hline 2x > 2 \\ \frac{2x}{2} > \frac{2}{2} \\ x > 1 \end{array}$$

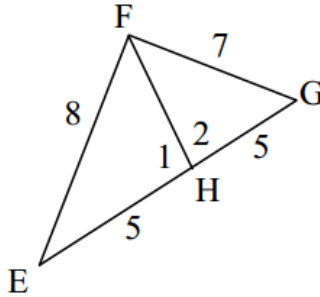
WORKSHEET

1) $m\angle 1, m\angle 2$



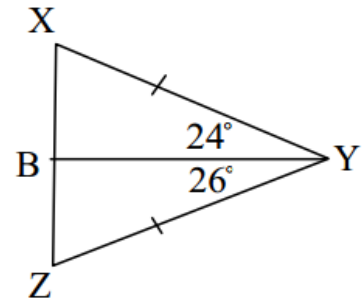
$m\angle 1 > m\angle 2$
SSS Ineq.

2) $m\angle 1, m\angle 2$



$m\angle 1 > m\angle 2$
SSS Ineq.

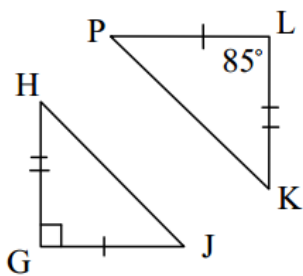
3) $\overline{XB}, \overline{ZB}$



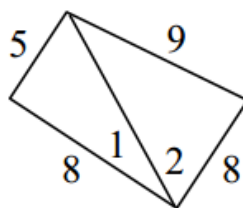
$\overline{XB} < \overline{ZB}$
SAS Ineq.

WORKSHEET

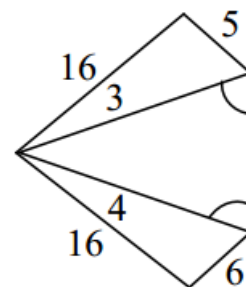
4) $\overline{HJ}, \overline{KP}$



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

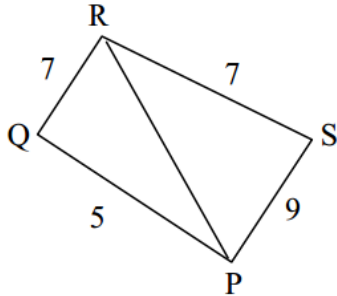


6) $m\angle 3, m\angle 4$



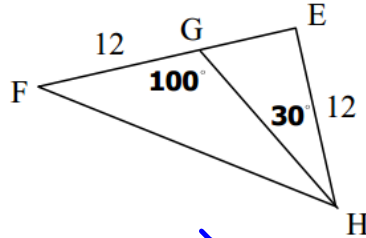
WORKSHEET

7) $m\angle PRQ, m\angle PRS$



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

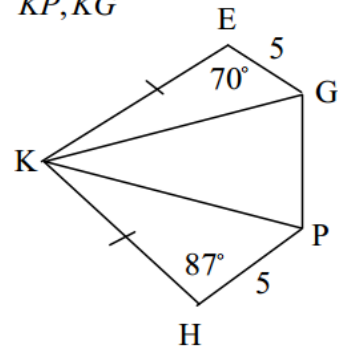
8) $\overline{FH}, \overline{GE}$



$FH > GE$

SAS Ineq.

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

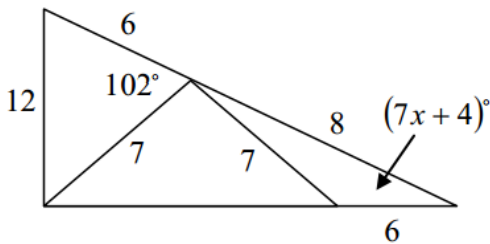


$KP > KG$
SAS Ineq.

WORKSHEET

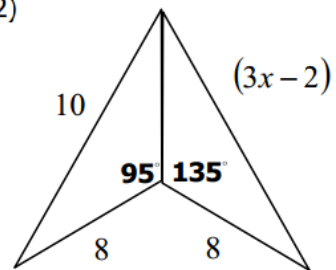
$3x - 2 > 10$ or $10 < 3x - 2$

10)

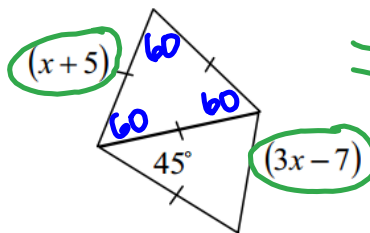


12)

$x > 4$



11)



$$\begin{aligned} x+5 &> 3x-7 \\ -x &\quad -x \\ \hline 5 &> 2x-7 \\ +7 &\quad +7 \\ \hline 12 &> 2x \\ 2 &\quad 2 \\ \hline 6 &> x \end{aligned}$$

$x < 6$