

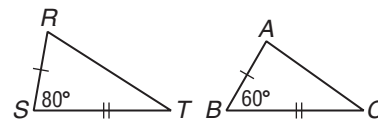
5-5 Study Guide and Intervention

Inequalities Involving Two Triangles

SAS Inequality The following theorem involves the relationship between the sides of two triangles and an angle in each triangle.

SAS Inequality/Hinge Theorem

If two sides of a triangle are congruent to two sides of another triangle and the included angle in one triangle has a greater measure than the included angle in the other, then the third side of the first triangle is longer than the third side of the second triangle.

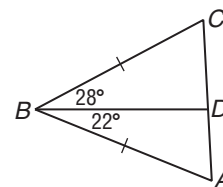


If $\overline{RS} \cong \overline{AB}$, $\overline{ST} \cong \overline{BC}$, and $m\angle S > m\angle B$, then $RT > AC$.

Example

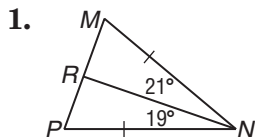
Write an inequality relating the lengths of \overline{CD} and \overline{AD} .

Two sides of $\triangle BCD$ are congruent to two sides of $\triangle BAD$ and $m\angle CBD > m\angle ABD$. By the SAS Inequality/Hinge Theorem, $CD > AD$.

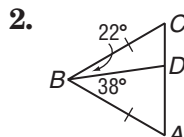


Exercises

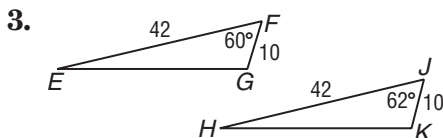
Write an inequality relating the given pair of segment measures.



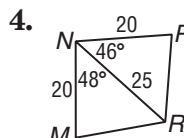
MR, RP



AD, CD

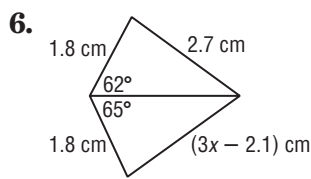
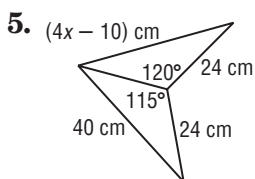


EG, HK



MR, PR

Write an inequality to describe the possible values of x .

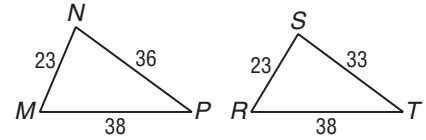


5-5 Study Guide and Intervention *(continued)***Inequalities Involving Two Triangles**

SSS Inequality The converse of the Hinge Theorem is also useful when two triangles have two pairs of congruent sides.

SSS Inequality

If two sides of a triangle are congruent to two sides of another triangle and the third side in one triangle is longer than the third side in the other, then the angle between the pair of congruent sides in the first triangle is greater than the corresponding angle in the second triangle.

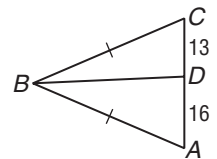


If $NM = SR$, $MP = RT$, and $NP > ST$, then $m\angle M > m\angle R$.

Example

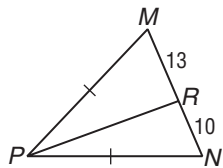
Write an inequality relating the measures of $\angle ABD$ and $\angle CBD$.

Two sides of $\triangle ABD$ are congruent to two sides of $\triangle CBD$, and $AD > CD$. By the SSS Inequality, $m\angle ABD > m\angle CBD$.

**Exercises**

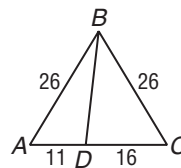
Write an inequality relating the given pair of angle measures.

1.



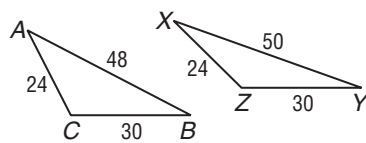
$m\angle MPR$, $m\angle NPR$

2.



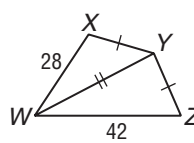
$m\angle ABD$, $m\angle CBD$

3.



$m\angle C$, $m\angle Z$

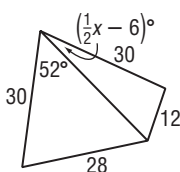
4.



$m\angle XYW$, $m\angle WYZ$

Write an inequality to describe the possible values of x .

5.



6.

