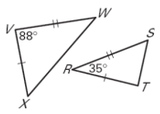
Lesson 4.2.1: Hinge Theorem

Hinge Theorem or SAS Inequality Theorem: If two sides of one triangle are congruent to two sides of another triangle, but the included angle of the first triangle is greater than the included angle of the second, then the third side of the first triangle is longer than the third side of the second.
Converse of Hinge Theorem or SSS Inequality Theorem: If two sides of one triangle are congruent to two sides of another triangle, but the third side of the first triangle is longer than the third side of the second, then the included angle of the first triangle is larger than the included angle of the second.

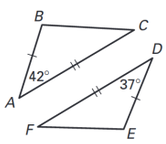
Practice Exercises 4.2.1

A. Write $<, >$, or $=$ to relate the measures of the given pair of segments.

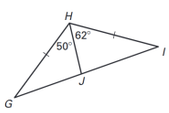
1. $\overline{WX}, \overline{ST}$



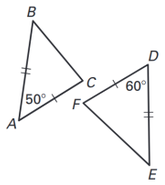
2. $\overline{BC}, \overline{EF}$



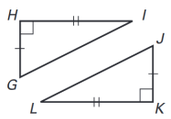
3. $\overline{JI}, \overline{JG}$



4. $\overline{BC}, \overline{EF}$

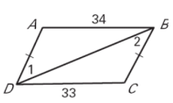


5. $\overline{IG}, \overline{LJ}$

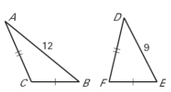


B. Write $<, >$, or $=$ to relate the measures of the given pair of angles.

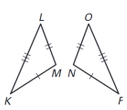
1. $\angle 1, \angle 2$



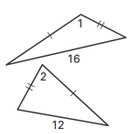
2. $\angle C, \angle F$



3. $\angle M, \angle N$

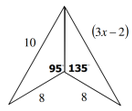


4. $\angle 1, \angle 2$

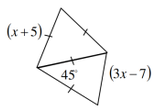


C. Write an inequality or pair of inequalities to describe the possible values of x.

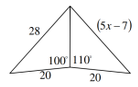
1.



2.



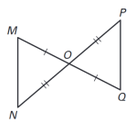
3.



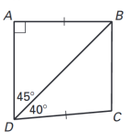
Activity 4.2.1

A. Write $<, >$, or $=$ to relate the measures of the given pair of segments.

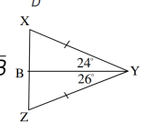
1. $\overline{MN}, \overline{QP}$



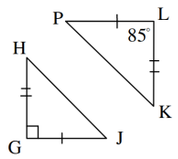
2. $\overline{AD}, \overline{BC}$



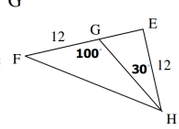
3. $\overline{XB}, \overline{ZB}$



4. $\overline{PK}, \overline{JH}$



5. $\overline{GE}, \overline{FH}$



B. Write $<, >$, or $=$ to relate the measures of the given pair of angles.

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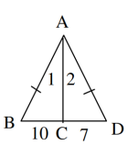
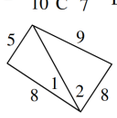
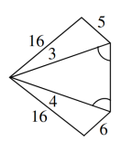


2. $\angle 1, \angle 2$

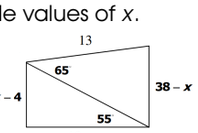


3. $\angle 3, \angle 4$

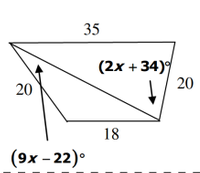


C. Write an inequality or pair of inequalities to describe the possible values of x.

1.



2.



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1. $\overline{WX}, \overline{ST}$

2. $\overline{BC}, \overline{EF}$

3. $\overline{JI}, \overline{JG}$

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B. Write $<, >$, or $=$ to relate the measures of the given pair of angles.

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2. $\angle C, \angle F$

3. $\angle M, \angle N$

4. $\angle 1, \angle 2$

C. Write an inequality or pair of inequalities to describe the possible values of x.

1.

2.

3.

Activity 4.2.1

A. Write $<, >$, or $=$ to relate the measures of the given pair of segments.

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2. $\angle 1, \angle 2$

3. $\angle 3, \angle 4$

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1.

2.