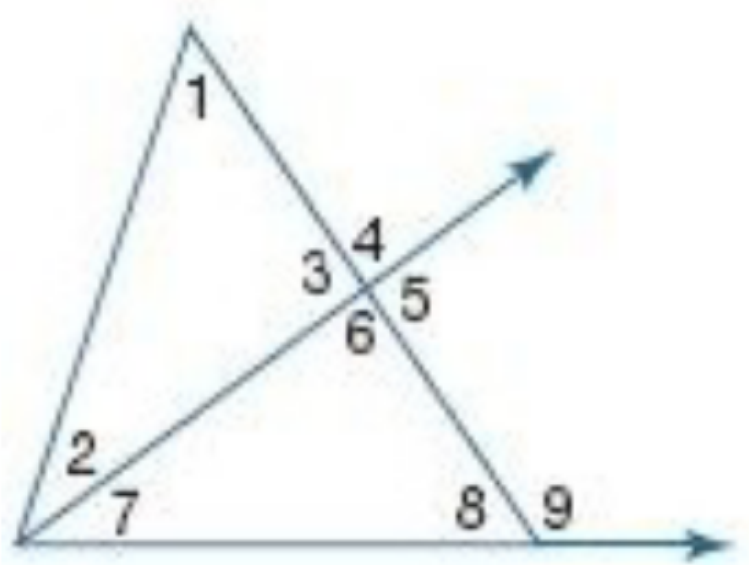
Applying Theorems on Triangle Inequality

Jonathan R. Bacolod

Sauyo High School

Example 1

Using the Exterior Angle Inequality theorem, determine whether each statement is True or False.



$m\angle 4 < m\angle 1$

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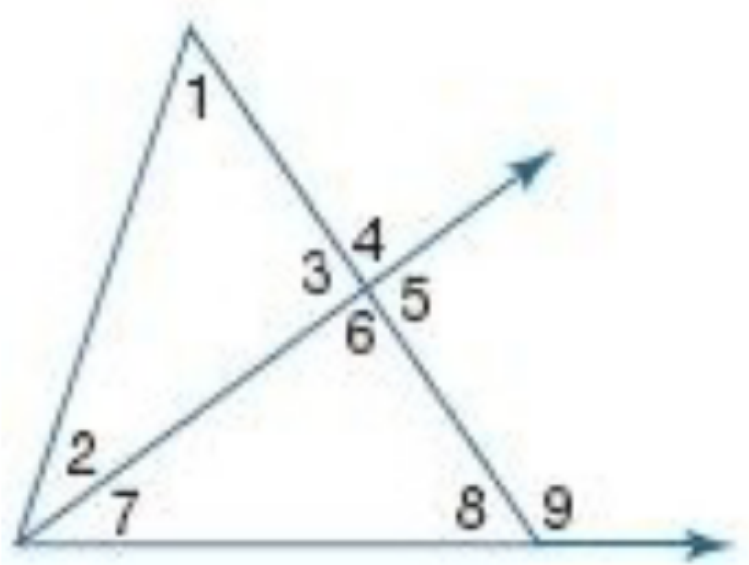
Using the Exterior Angle Inequality theorem, determine whether each statement is True or False.



$m\angle 4 < m\angle 1$

False

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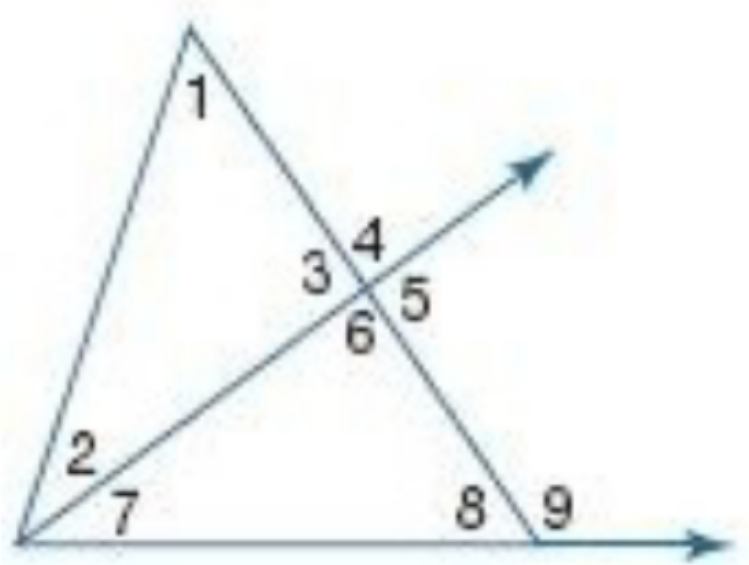
Using the Exterior Angle Inequality theorem, determine whether each statement is True or False.



$m\angle 5 > m\angle 8$

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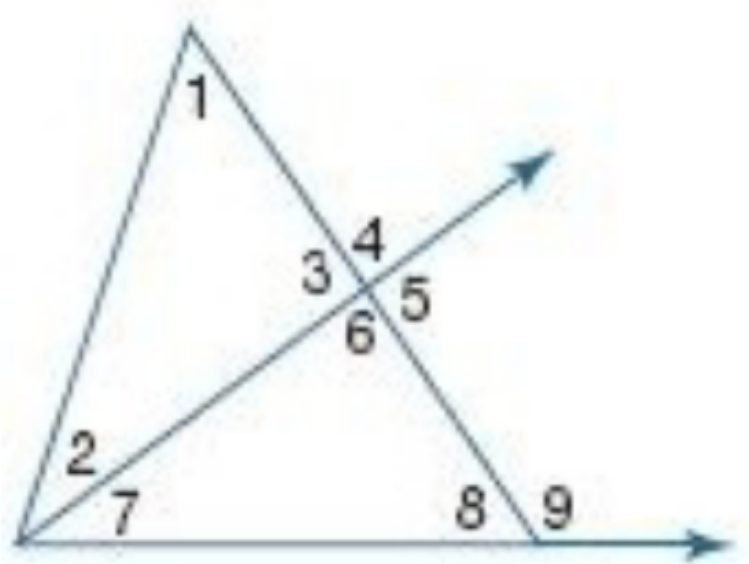
Using the Exterior Angle Inequality theorem, determine whether each statement is True or False.



$m\angle 5 > m\angle 8$

True

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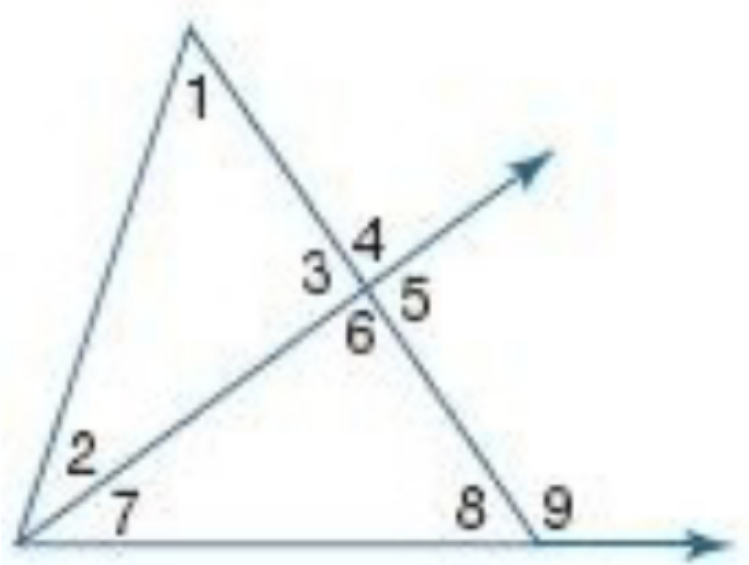
Using the Exterior Angle Inequality theorem, determine whether each statement is True or False.



$m\angle 9 < m\angle 6$

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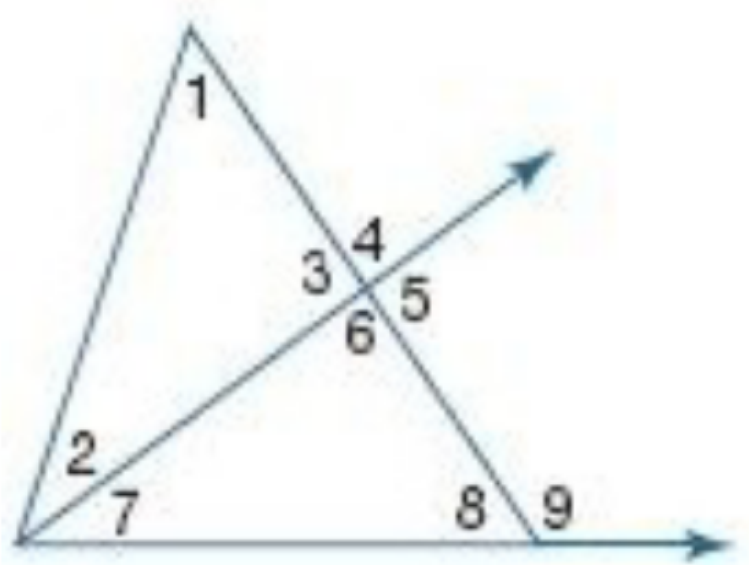

$m\angle 9 < m\angle 6$

False

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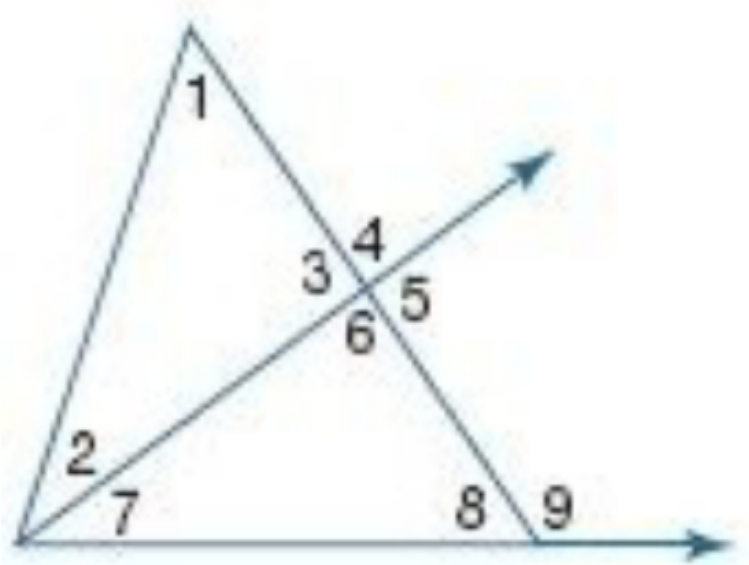

$m\angle 2 < m\angle 4$

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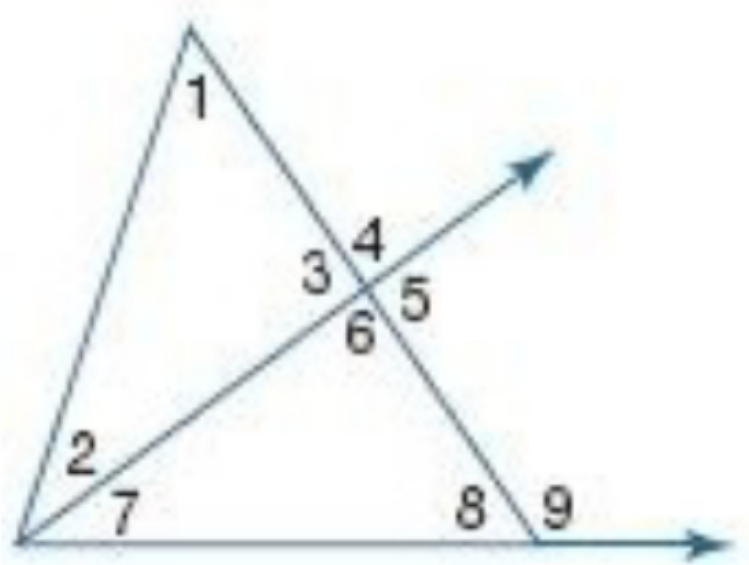

$m\angle 2 < m\angle 4$

True

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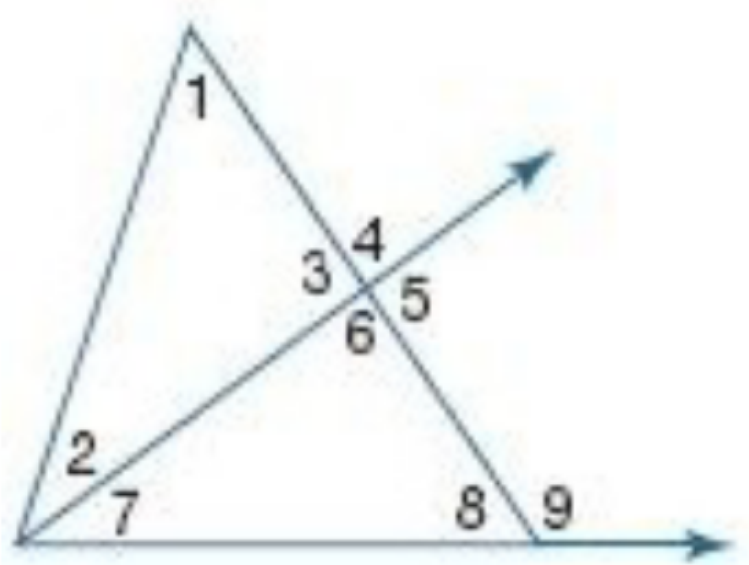

$m\angle 8 < m\angle 5$

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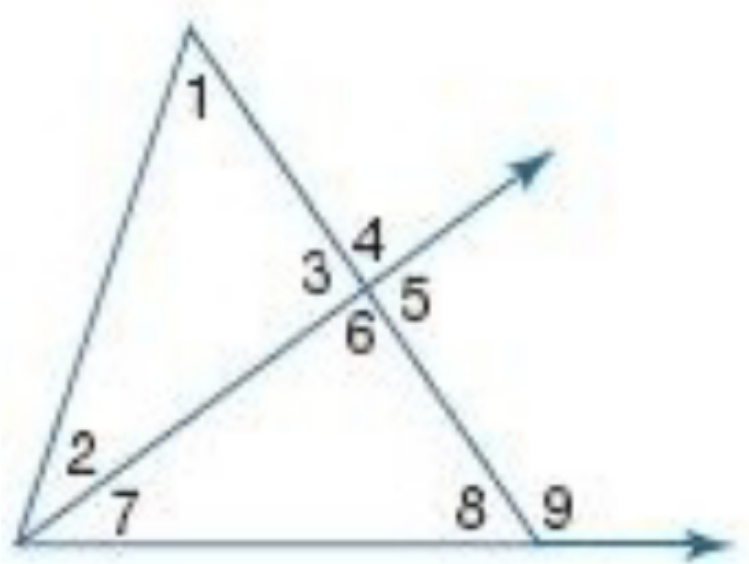
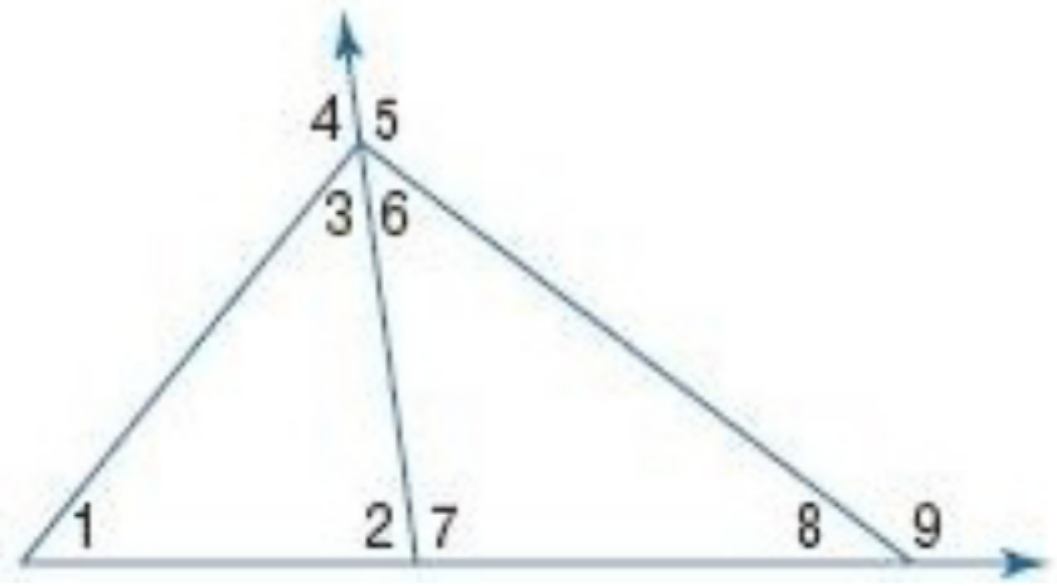


$m\angle 8 < m\angle 5$

True

Example 2

Using the Exterior Angle Inequality theorem, list all the angles that satisfy the stated condition.



1. measures greater than $m\angle 7$

Example 2

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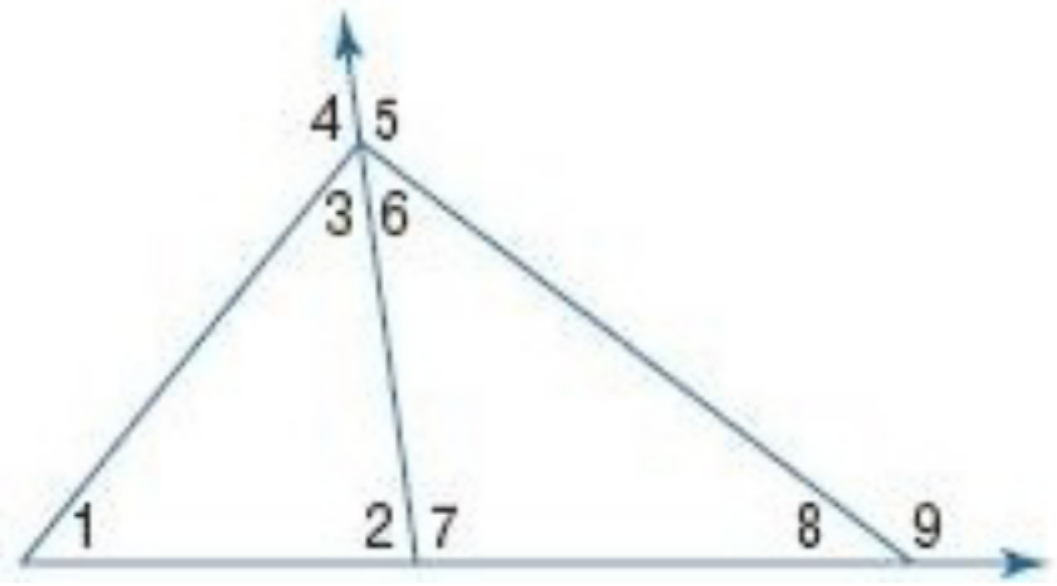

1. measures greater than $m\angle 7$

$\angle 5, \angle 9$

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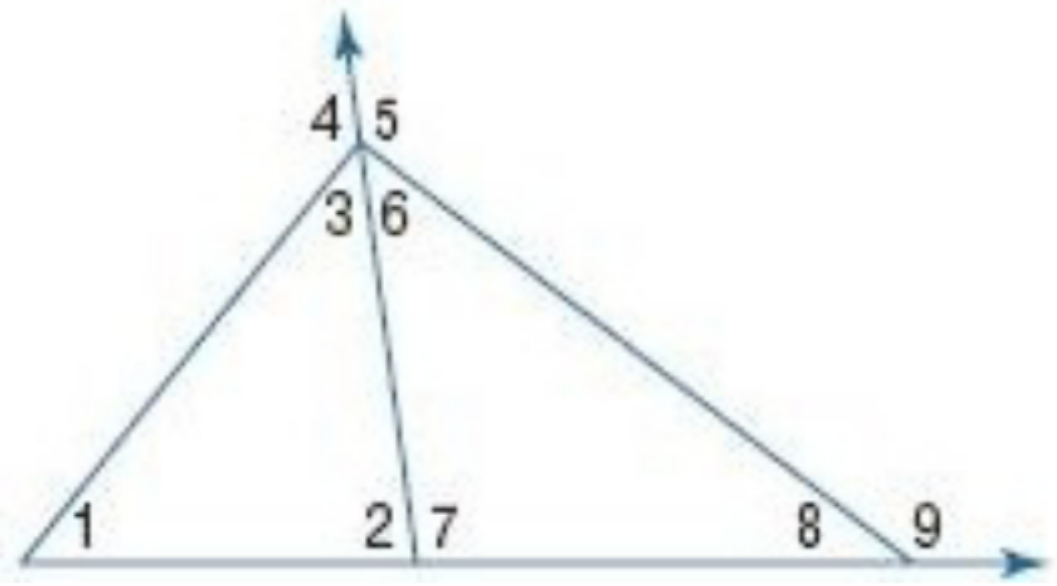
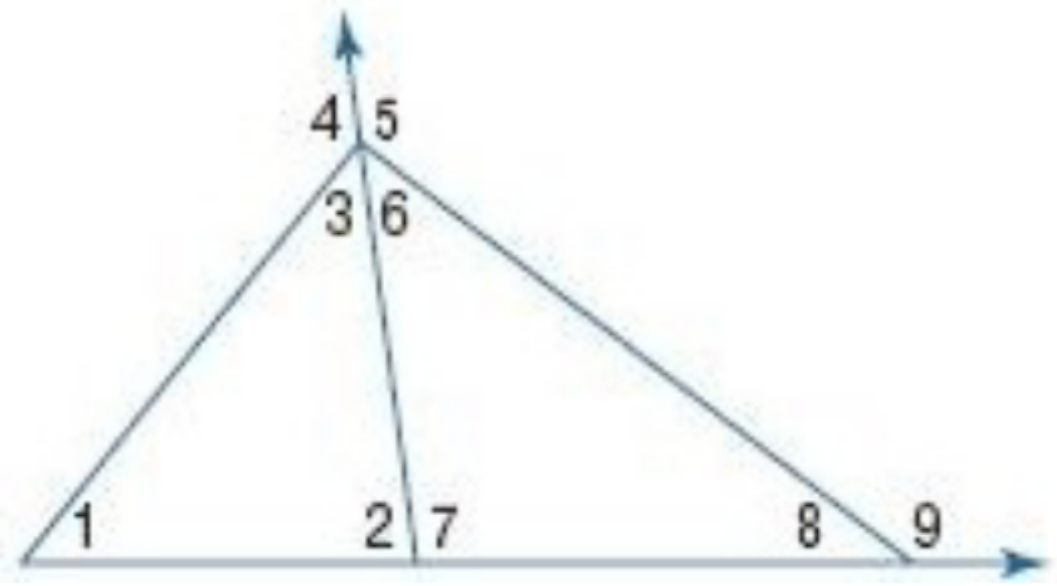


2. measures less than $m\angle 7$

Example 2

Using the Exterior Angle Inequality theorem, list all the angles that satisfy the stated condition.



2. measures less than $m\angle 7$

$\angle 1, \angle 3$

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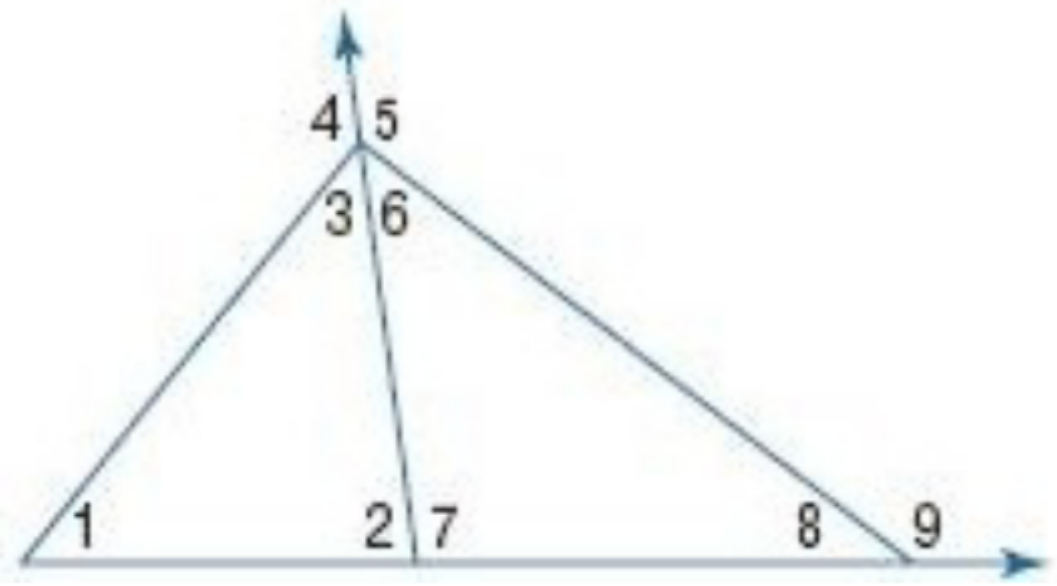
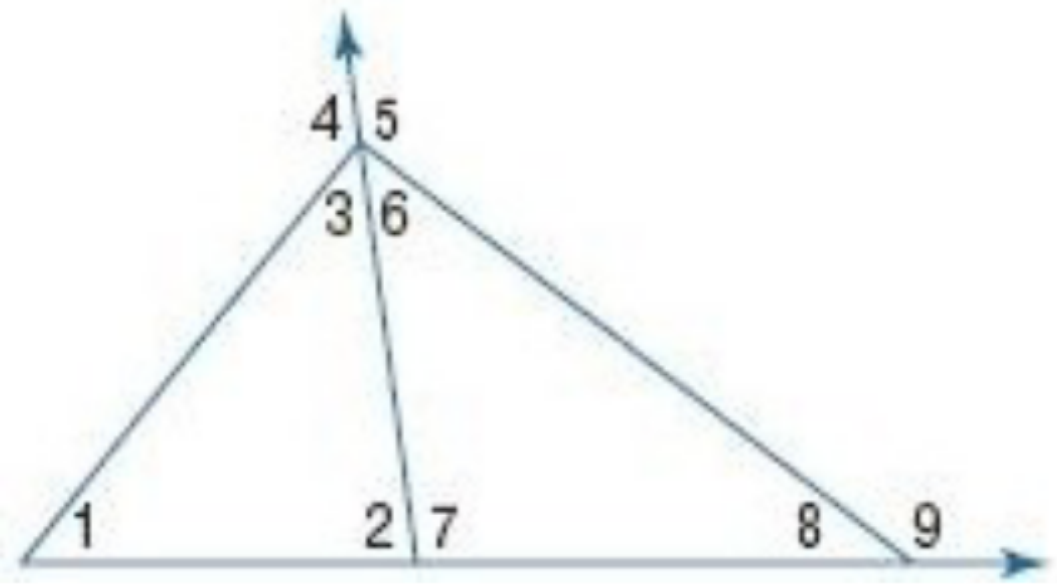


3. measures greater than $m\angle 6$

Example 2

Using the Exterior Angle Inequality theorem, list all the angles that satisfy the stated condition.



3. measures greater than $m\angle 6$

$\angle 2, \angle 9$

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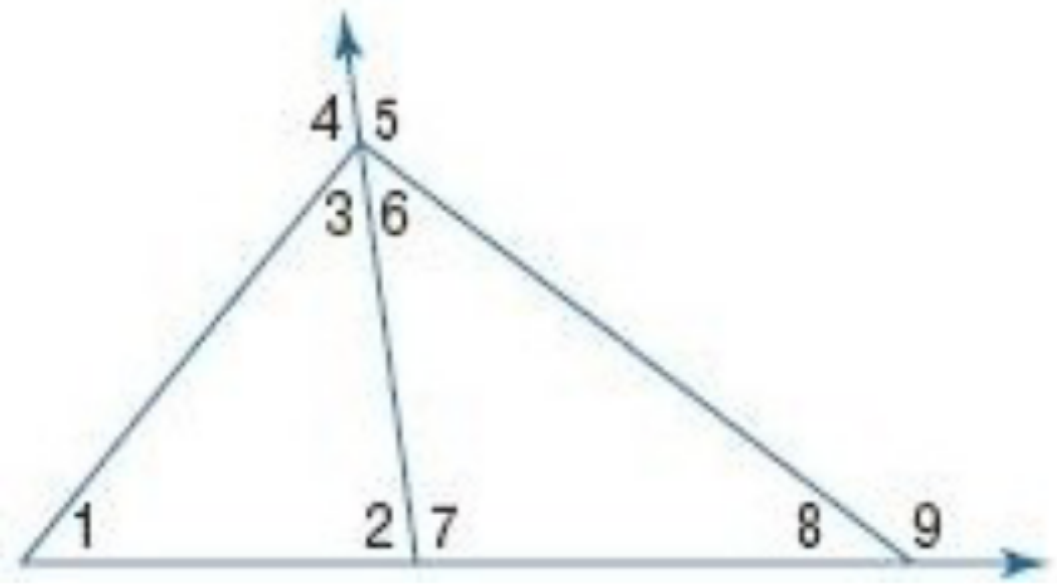

4. measures less than $m\angle 2$

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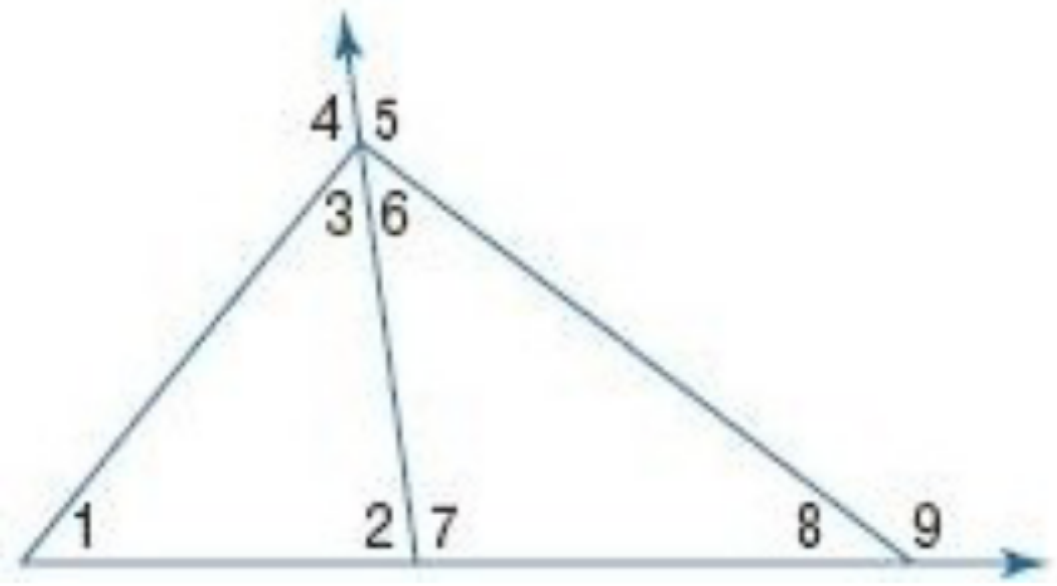

4. measures less than $m\angle 2$

$\angle 6, \angle 8$

Example 2

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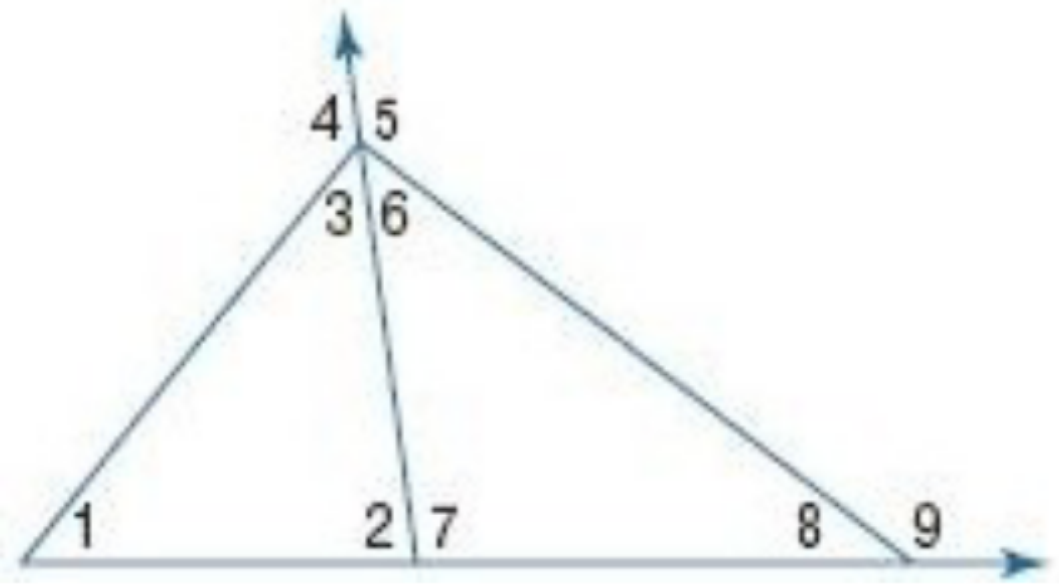

5. measures greater than $m\angle 2$

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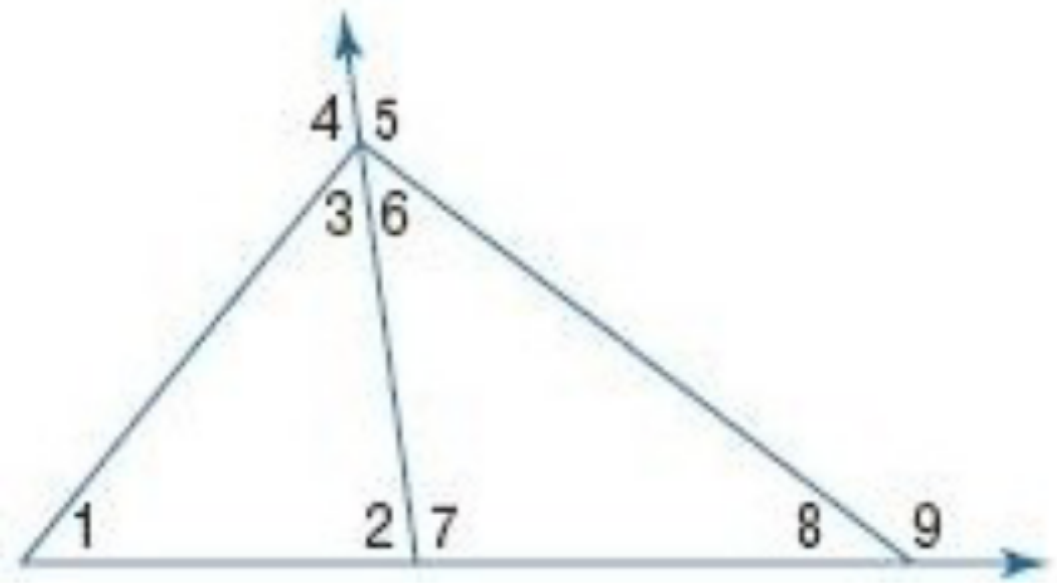
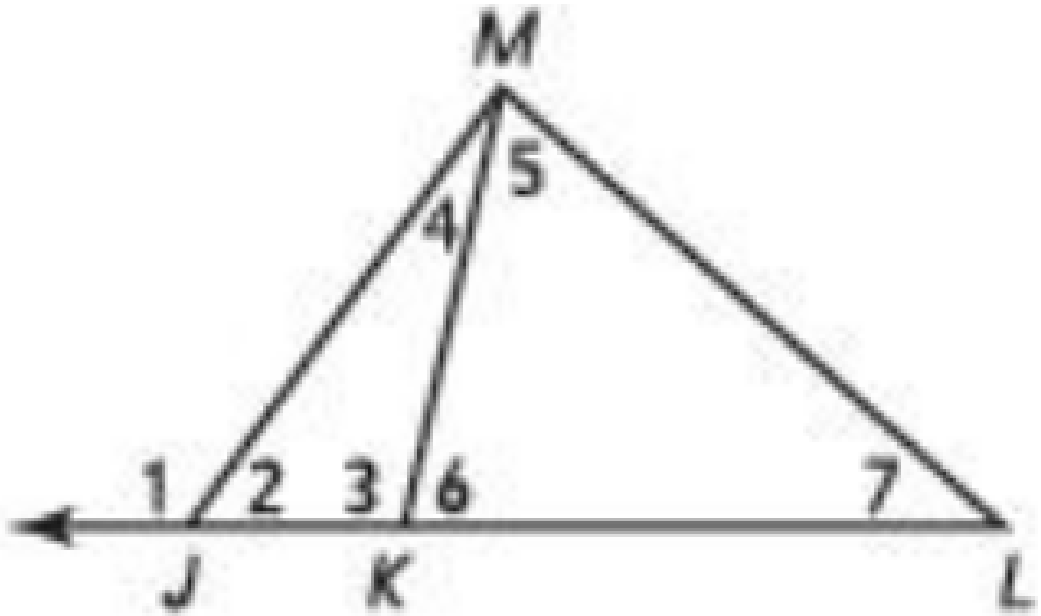


5. measures greater than $m\angle 2$

$\angle 4$

Example 3

Using the Exterior Angle Inequality theorem, determine the inequality symbol that makes the statement correct.



1. $m\angle 1$____$m\angle 3$

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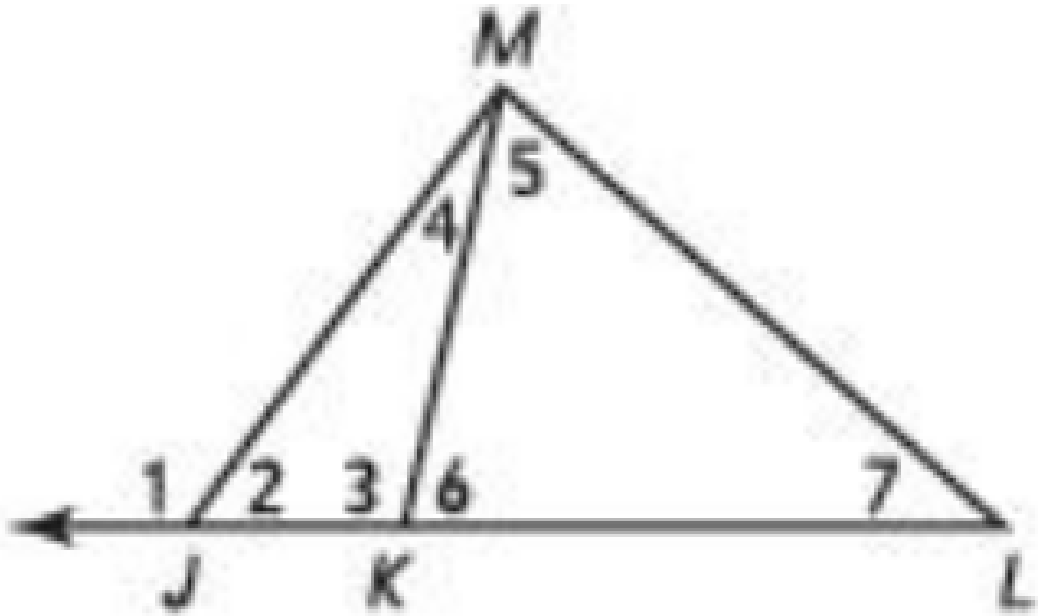
Using the Exterior Angle Inequality theorem, determine the inequality symbol that makes the statement correct.



1. $m\angle 1 > m\angle 3$

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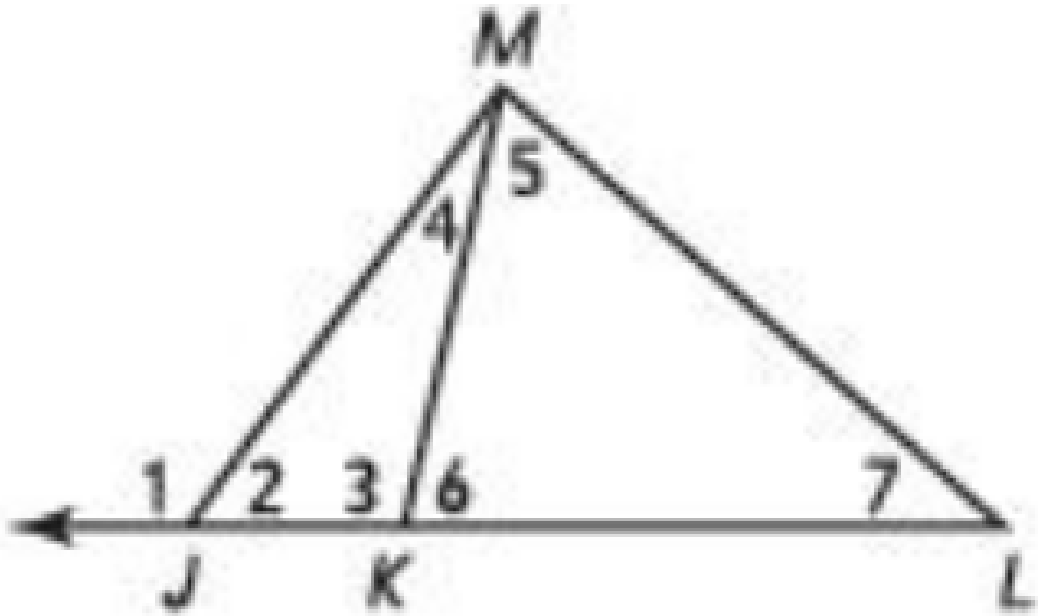

2. $m\angle 5$____$m\angle 3$

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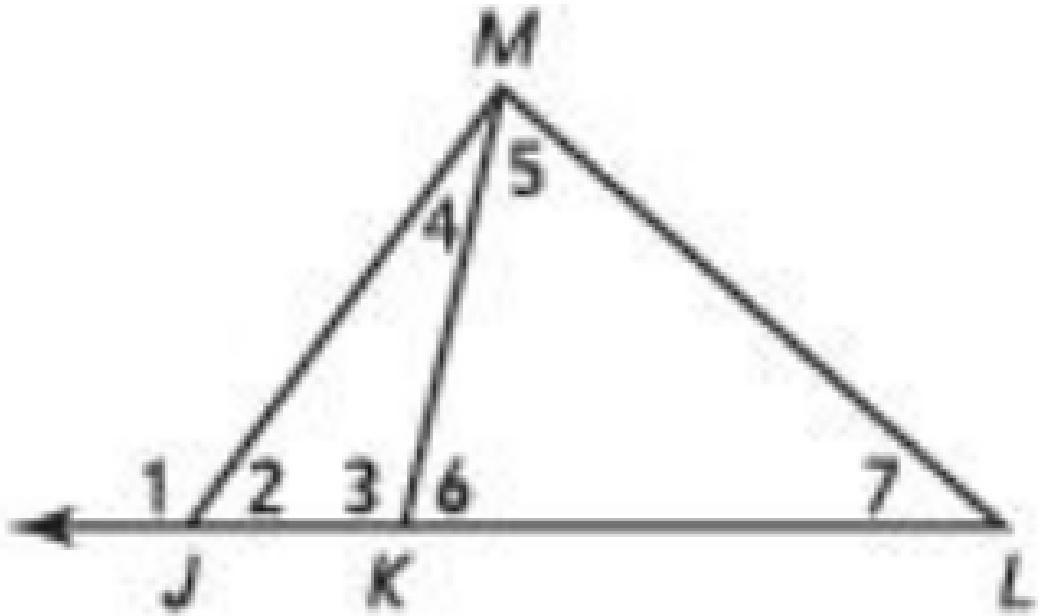

2. $m\angle 5 < m\angle 3$

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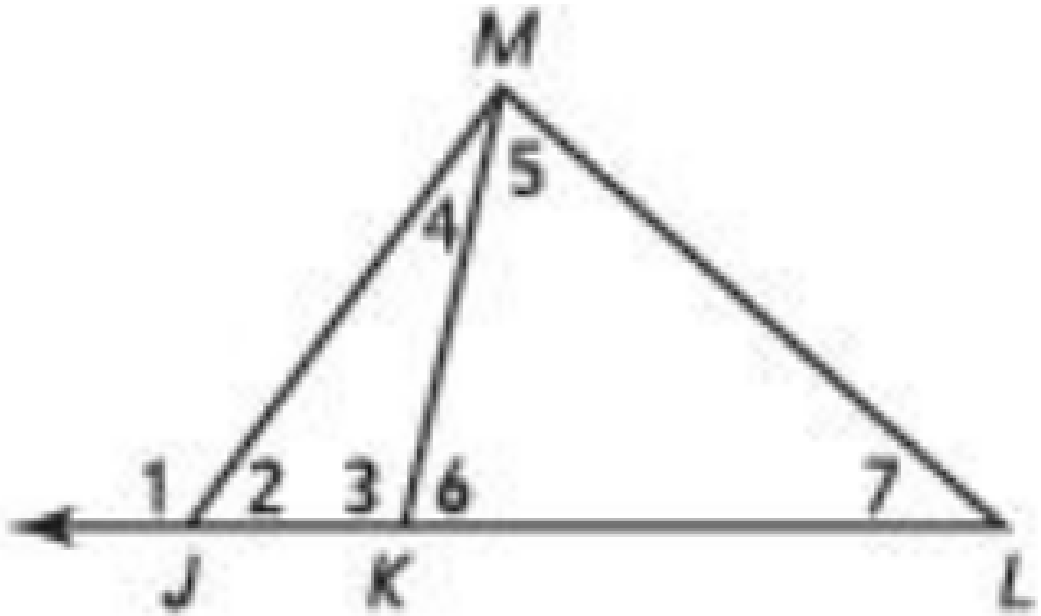

3. $m\angle 7 \_\_\_\_ m\angle 1$

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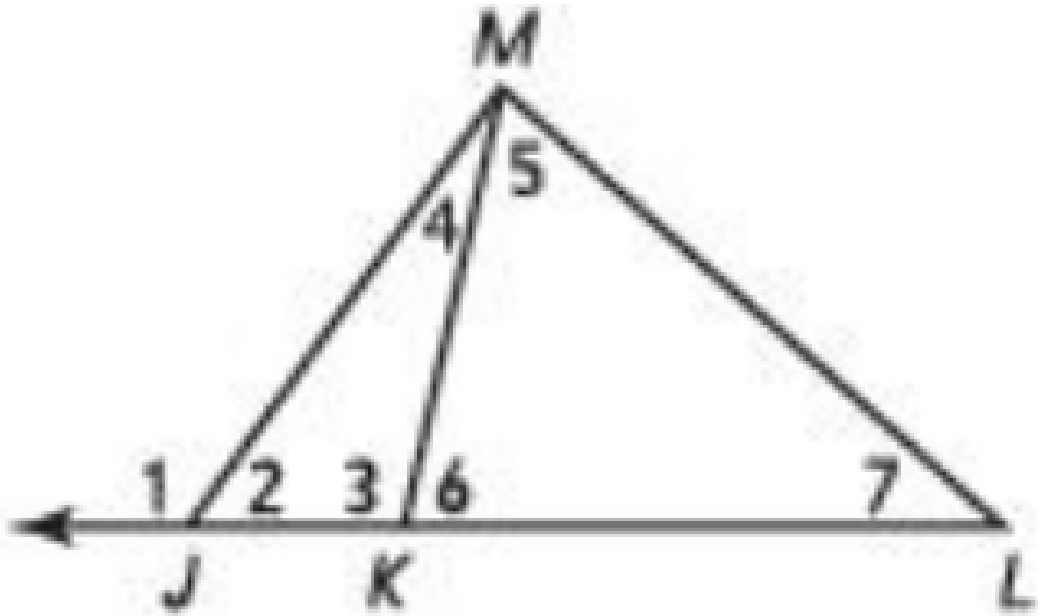

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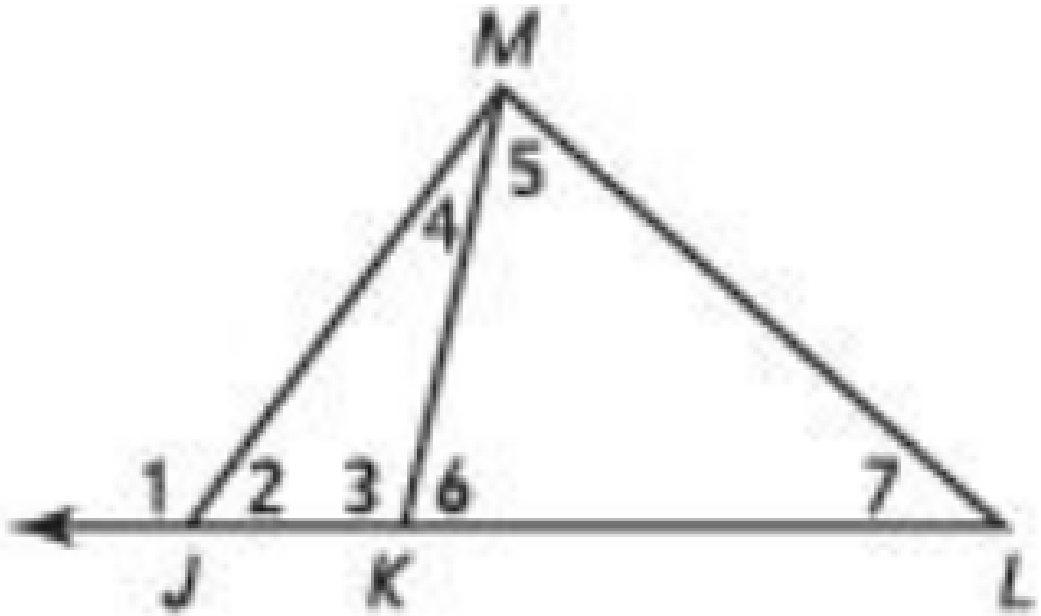

4. $m\angle 4 \_\_\_\_ m\angle 6$

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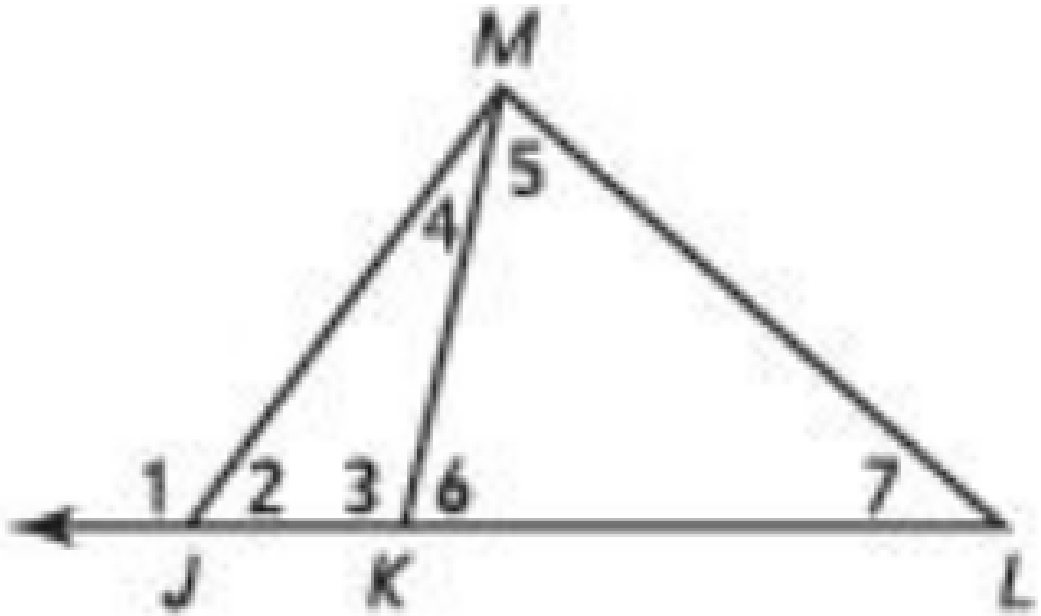

4. $m\angle 4 < m\angle 6$

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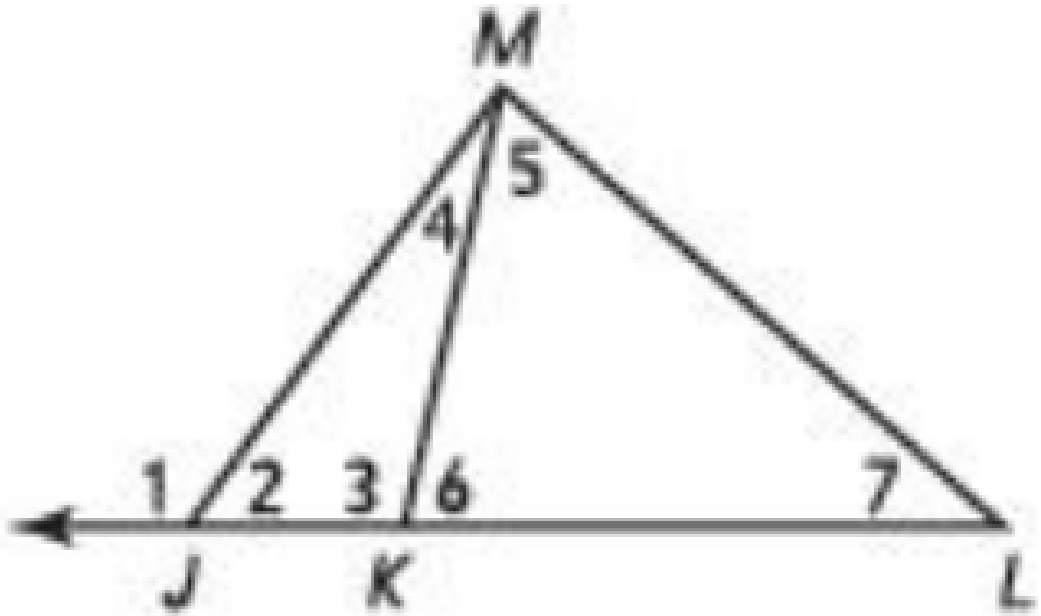

5. $m\angle 3 \_\_\_\_ m\angle 7$

Example 3

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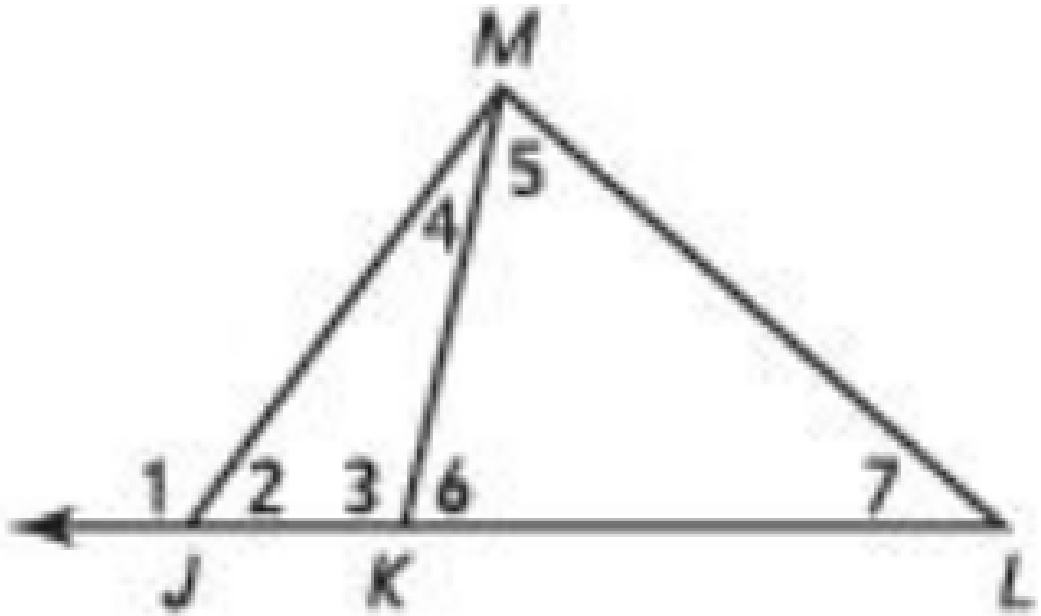

5. $m\angle 3 > m\angle 7$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$ True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$ True
$14 + 9 > 7$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$	True
$14 + 9 > 7$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$	True
$14 + 9 > 7$	True
$7 + 9 > 14$	

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$	True
$14 + 9 > 7$	True
$7 + 9 > 14$	True

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

1. $7, 14, 9$

$7 + 14 > 9$	True
$14 + 9 > 7$	True
$7 + 9 > 14$	True

Yes

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

2. $4, 6, 2$

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2. $4, 6, 2$

$4 + 6 > 2$

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2. $4, 6, 2$

$4 + 6 > 2$ True

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2. $4, 6, 2$

$4 + 6 > 2$ True
$6 + 2 > 4$

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

2. $4, 6, 2$

$4 + 6 > 2$	True
$6 + 2 > 4$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

2. $4, 6, 2$

$4 + 6 > 2$	True
$6 + 2 > 4$	True
$4 + 2 > 6$	

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

2. $4, 6, 2$

$4 + 6 > 2$	True
$6 + 2 > 4$	True
$4 + 2 > 6$	False

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

2. $4, 6, 2$

$4 + 6 > 2$	True
$6 + 2 > 4$	True
$4 + 2 > 6$	False

No

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3. $8, 3, 8$

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3. $8, 3, 8$

$8 + 3 > 8$

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3. $8, 3, 8$

$8 + 3 > 8$ True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

3. $8, 3, 8$

$8 + 3 > 8$ True
$3 + 8 > 8$

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

3. $8, 3, 8$

$8 + 3 > 8$	True
$3 + 8 > 8$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

3. $8, 3, 8$

$8 + 3 > 8$	True
$3 + 8 > 8$	True
$8 + 8 > 3$	

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

3. $8, 3, 8$

$8 + 3 > 8$	True
$3 + 8 > 8$	True
$8 + 8 > 3$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

3. $8, 3, 8$

$8 + 3 > 8$	True
$3 + 8 > 8$	True
$8 + 8 > 3$	True

Yes

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$ True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$ True
$5 + 8 > 6$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$	True
$5 + 8 > 6$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$	True
$5 + 8 > 6$	True
$6 + 8 > 5$	

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$	True
$5 + 8 > 6$	True
$6 + 8 > 5$	True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

4. $6, 5, 8$

$6 + 5 > 8$	True
$5 + 8 > 6$	True
$6 + 8 > 5$	True

Yes

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. 1, 13, 11

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$ True

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$ True
$13 + 11 > 1$

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$	True
$13 + 11 > 1$	True

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Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$	True
$13 + 11 > 1$	True
$1 + 11 > 13$	

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

$1 + 13 > 11$	True
$13 + 11 > 1$	True
$1 + 11 > 13$	False

Example 4

Using the Triangle Inequality theorem, write *Yes* if the given measures can form a triangle or *No* if not.

5. $1, 13, 11$

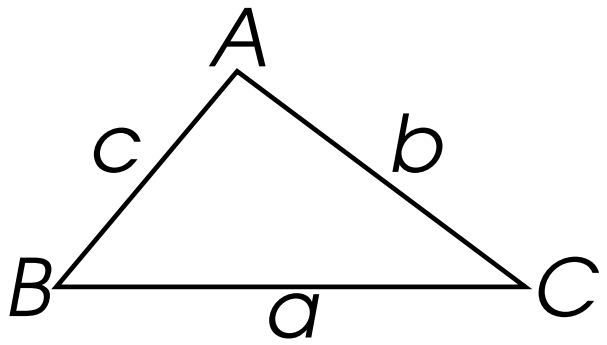
$1 + 13 > 11$	True
$13 + 11 > 1$	True
$1 + 11 > 13$	False

No

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

1. $a = 5, b = 8$



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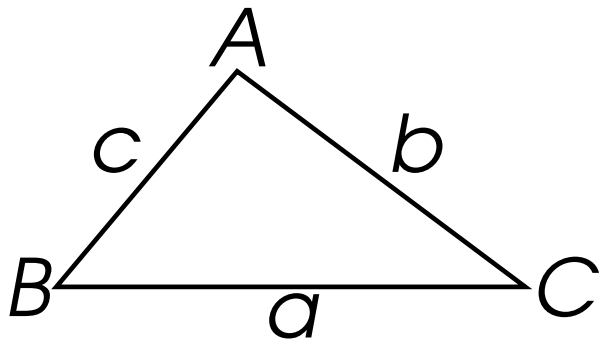
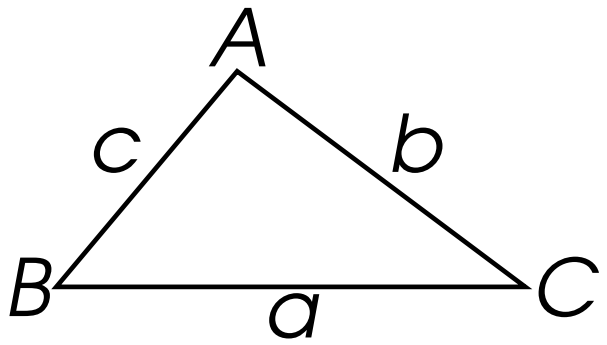


1. $a = 5, b = 8$

$a + b > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

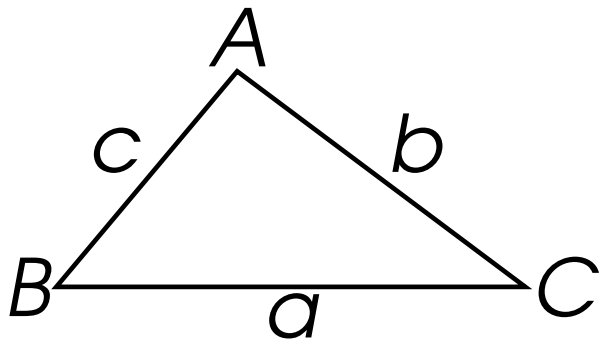


1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

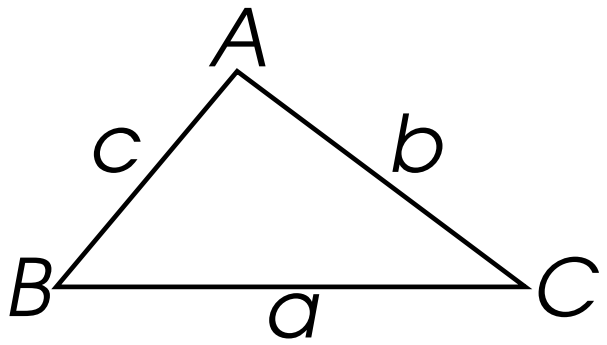


1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$
$13 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



1. $a = 5, b = 8$

$a + b > c \qquad b + c > a$
$5 + 8 > c$
$13 > c$

Example 5

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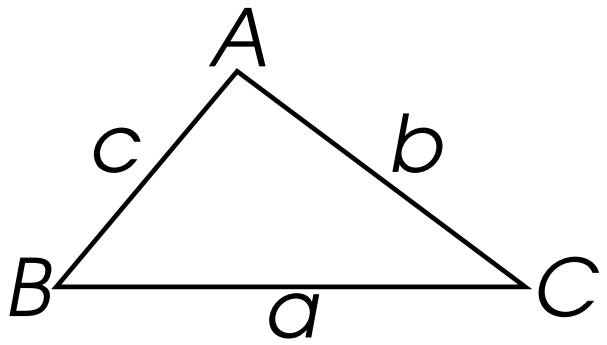


1. $a = 5, b = 8$

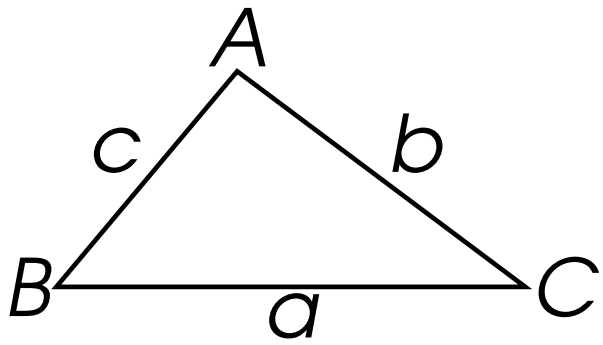
$a + b > c$ $\quad$ $b + c > a$

$5 + 8 > c$ $\quad$ $8 + c > 5$

$13 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



1. $a = 5, b = 8$

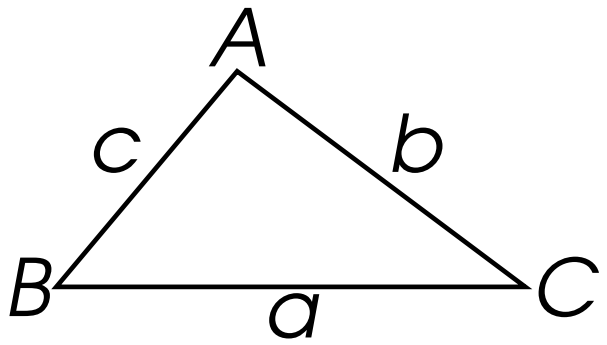
$a + b > c$ $\quad$ $b + c > a$

$5 + 8 > c$ $\quad$ $8 + c > 5$

$13 > c$ $\quad$ $8 - 8 + c > 5 - 8$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



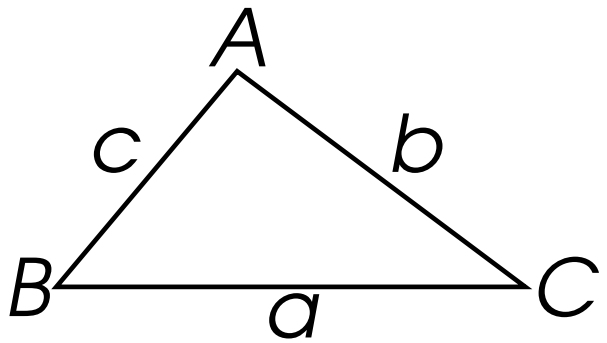
1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

$a + c > b$

Example 5

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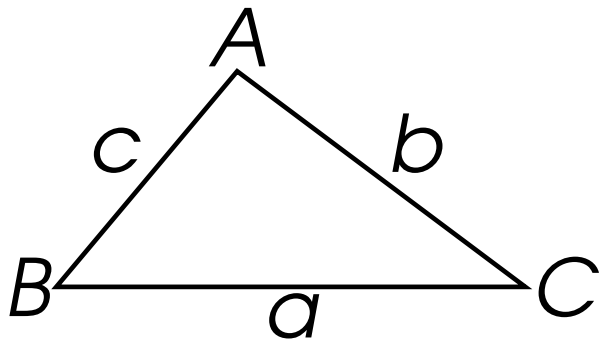

1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

$a + c > b$
$5 + c > 8$

Example 5

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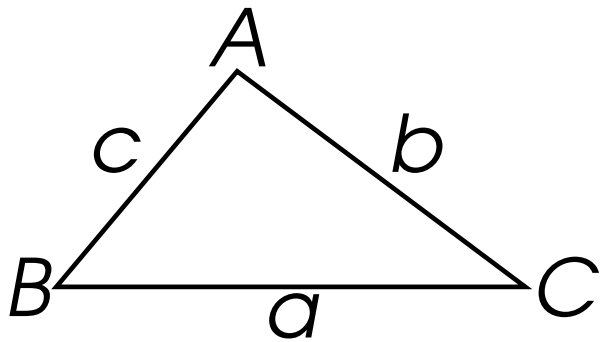
1. $a = 5, b = 8$



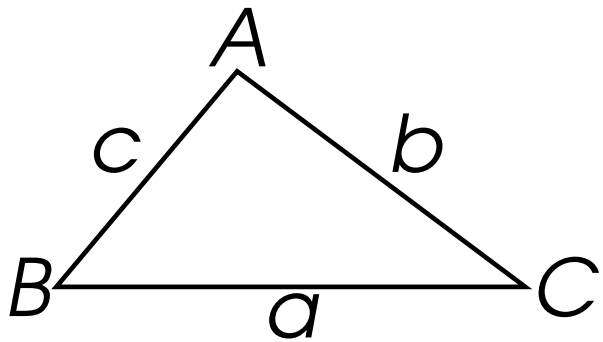
$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

$a + c > b$
$5 + c > 8$
$5 - 5 + c > 8 - 5$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



1. $a = 5, b = 8$

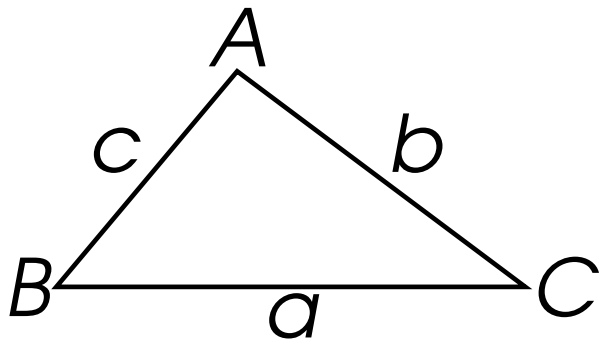
$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

$a + c > b$
$5 + c > 8$
$5 - 5 + c > 8 - 5$
$c > 3$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



1. $a = 5, b = 8$

$a + b > c$
$5 + 8 > c$
$13 > c$

$b + c > a$
$8 + c > 5$
$8 - 8 + c > 5 - 8$
$c > -3$

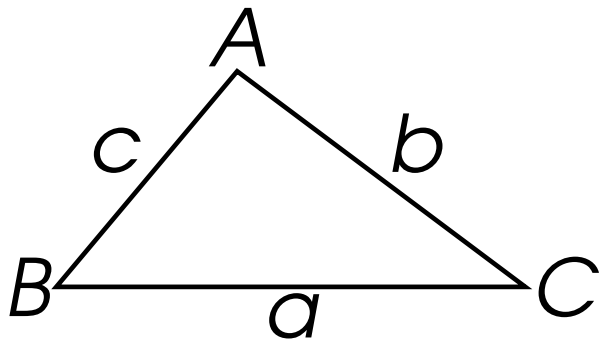
$a + c > b$
$5 + c > 8$
$5 - 5 + c > 8 - 5$
$c > 3$

$$\therefore 3 < c < 13$$

Example 5

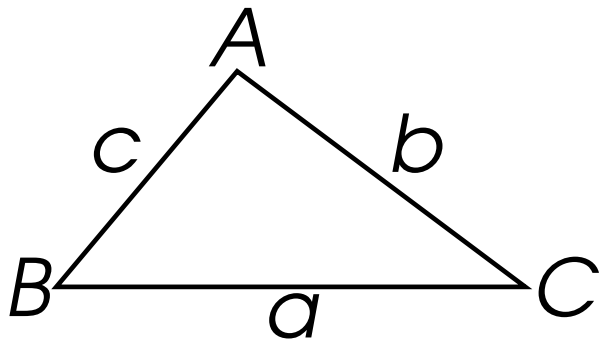
Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

2. $a = 5, c = 10$



Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

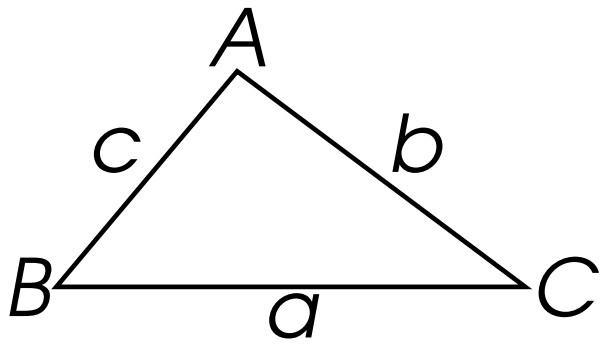


2. $a = 5, c = 10$

$a + b > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

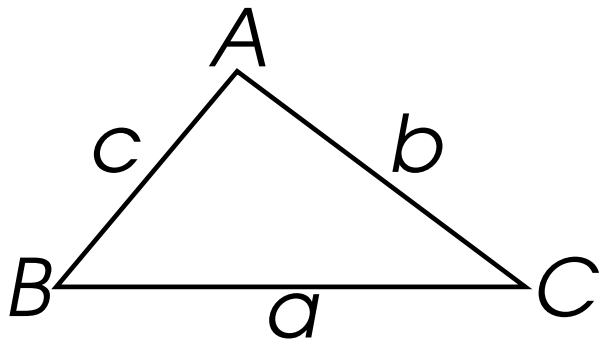


2. $a = 5, c = 10$

$a + b > c$
$5 + b > 10$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

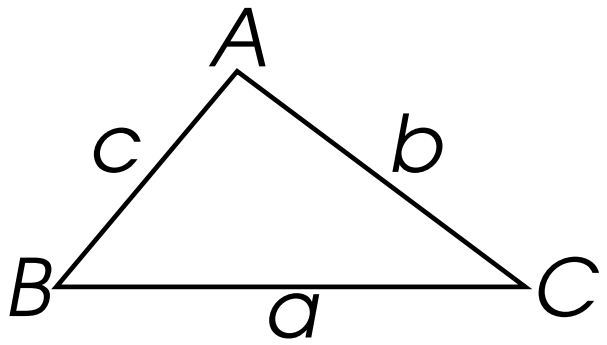


2. $a = 5, c = 10$

$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



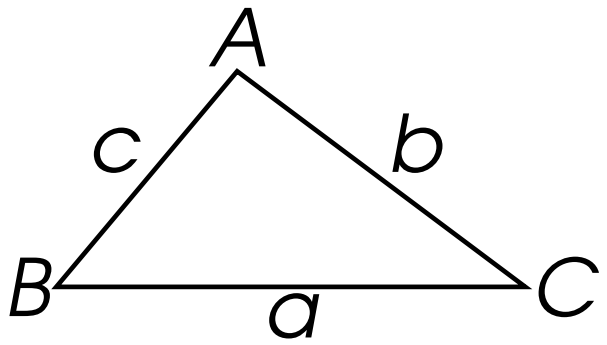
2. $a = 5, c = 10$

$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

2. $a = 5, c = 10$



$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

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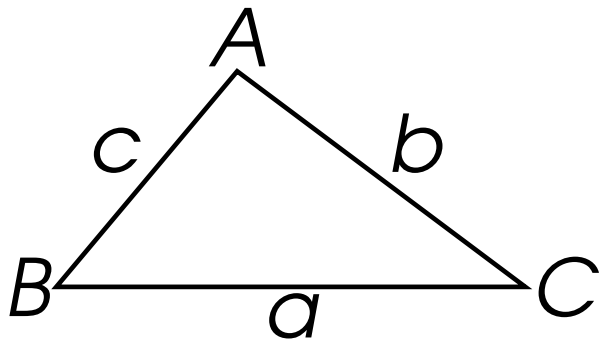

$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$

Example 5

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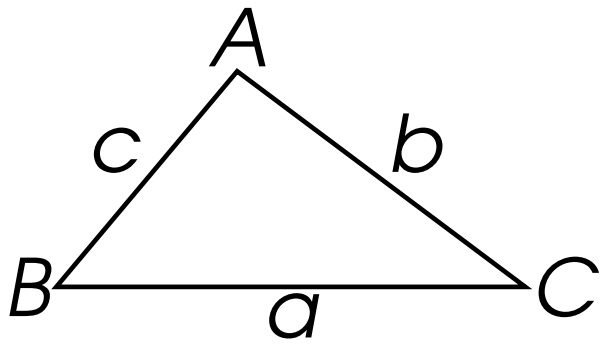


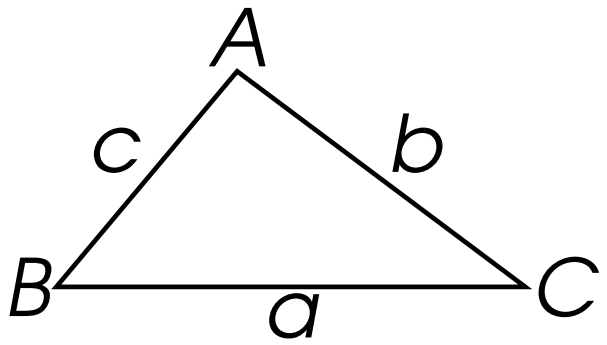
$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

2. $a = 5, c = 10$



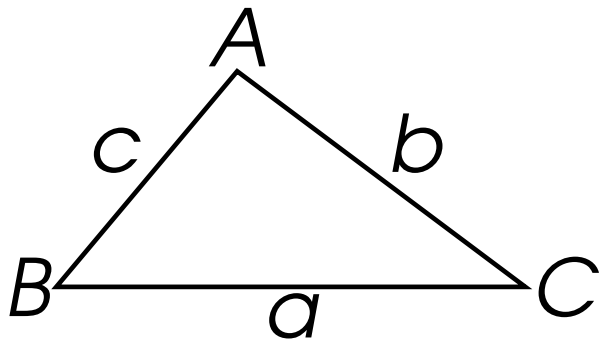
$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$
$b > -5$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

2. $a = 5, c = 10$



$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$
$b > -5$

$a + c > b$

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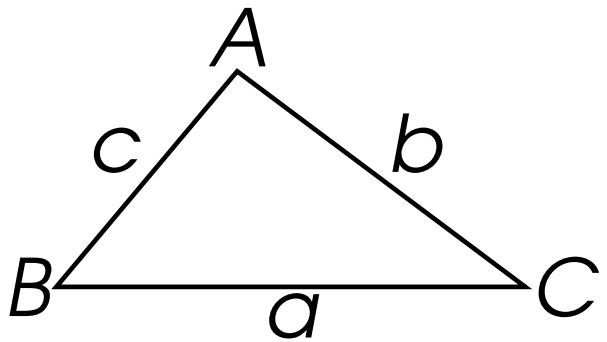
2. $a = 5, c = 10$



$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$
$b > -5$

$a + c > b$
$5 + 10 > b$

Example 5

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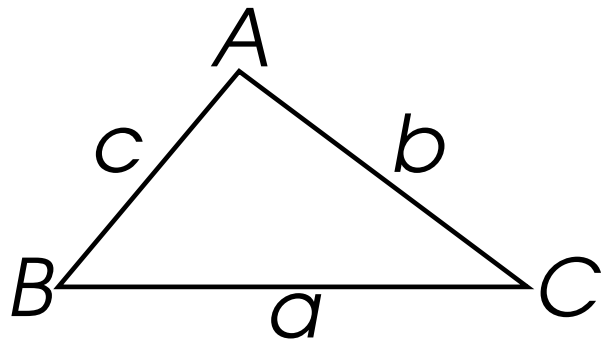
2. $a = 5, c = 10$



$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

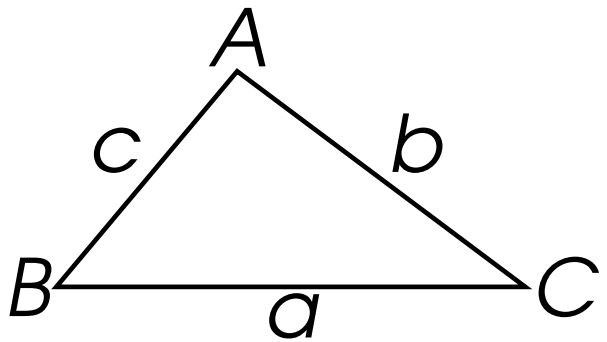
$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$
$b > -5$

$a + c > b$
$5 + 10 > b$
$15 > b$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

2. $a = 5, c = 10$



$a + b > c$
$5 + b > 10$
$5 - 5 + b > 10 - 5$
$b > 5$

$b + c > a$
$b + 10 > 5$
$b + 10 - 10 > 5 - 10$
$b > -5$

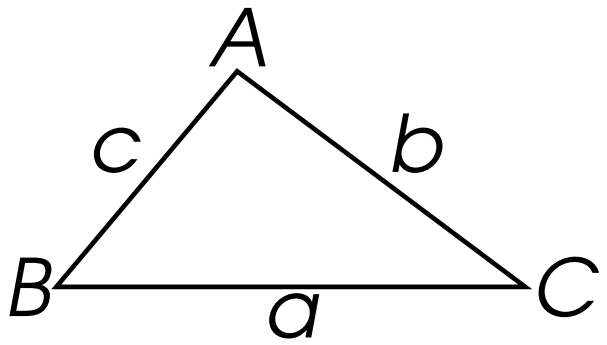
$a + c > b$
$5 + 10 > b$
$15 > b$

$$\therefore 5 < b < 15$$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

3. $b = 10, c = 8$



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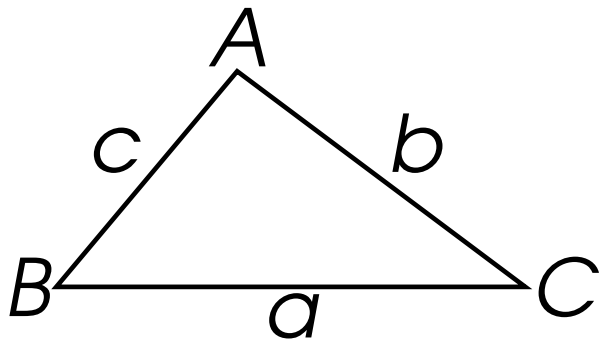
Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

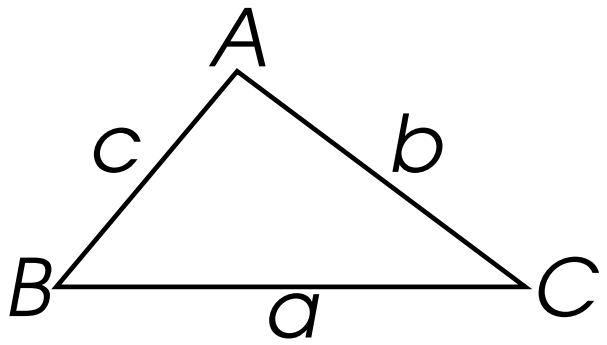


3. $b = 10, c = 8$

$a + b > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

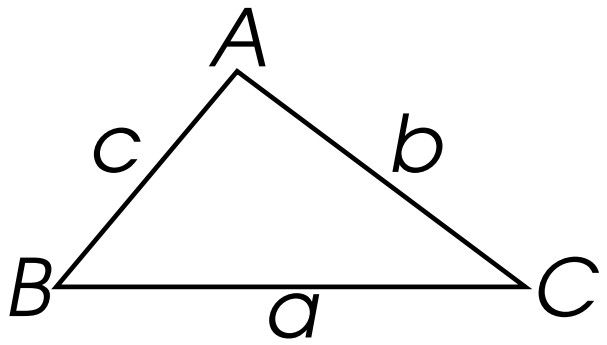


3. $b = 10, c = 8$

$a + b > c$
$a + 10 > 8$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



3. $b = 10, c = 8$

$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$

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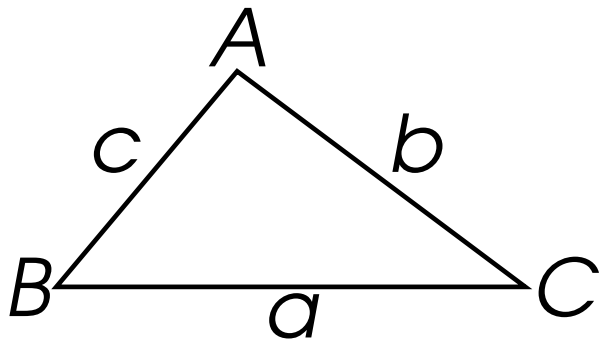


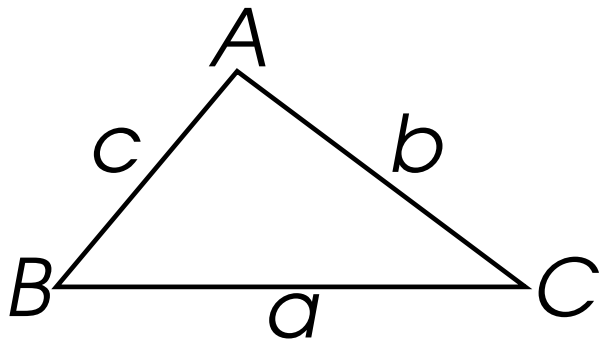
3. $b = 10, c = 8$

$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

3. $b = 10, c = 8$



$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$

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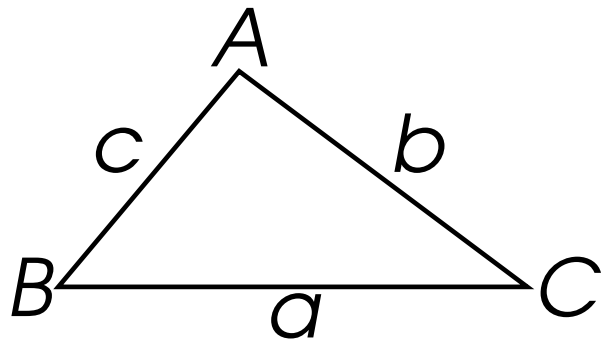

$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$
$10 + 8 > a$

Example 5

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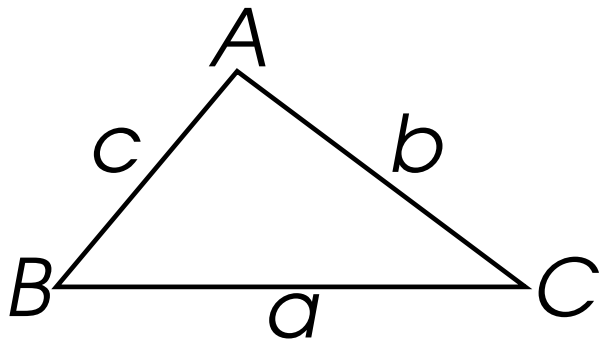
3. $b = 10, c = 8$



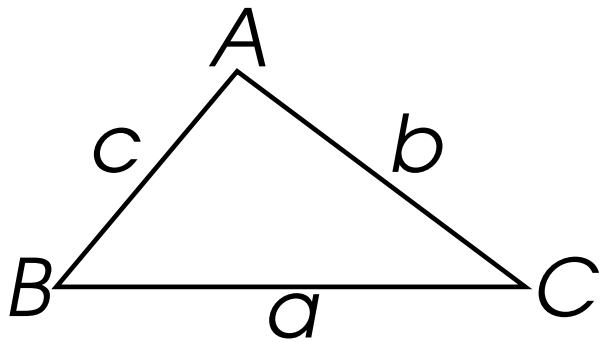
$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$
$10 + 8 > a$
$18 > a$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

3. $b = 10, c = 8$



$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$
$10 + 8 > a$
$18 > a$

$a + c > b$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

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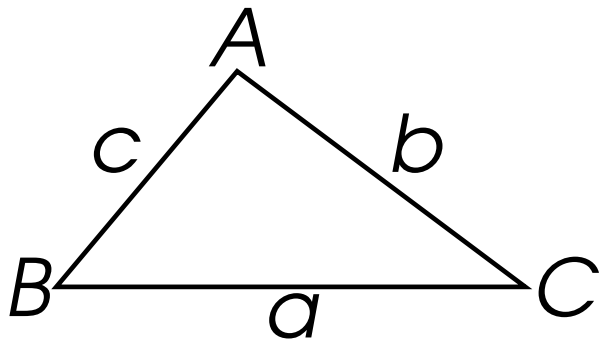

$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$
$10 + 8 > a$
$18 > a$

$a + c > b$
$a + 8 > 10$

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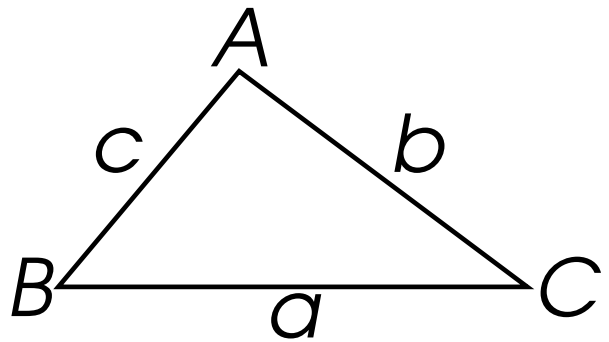


$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

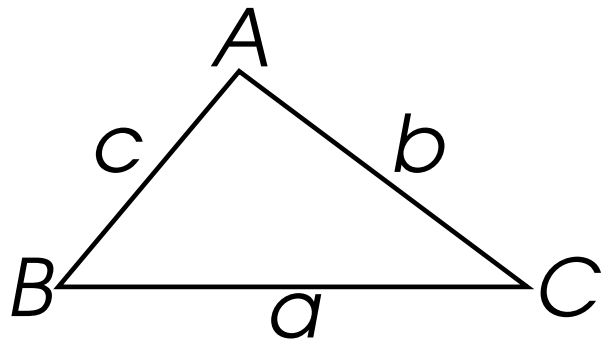
$b + c > a$
$10 + 8 > a$
$18 > a$

$a + c > b$
$a + 8 > 10$
$a + 8 - 8 > 10 - 8$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

3. $b = 10, c = 8$



$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

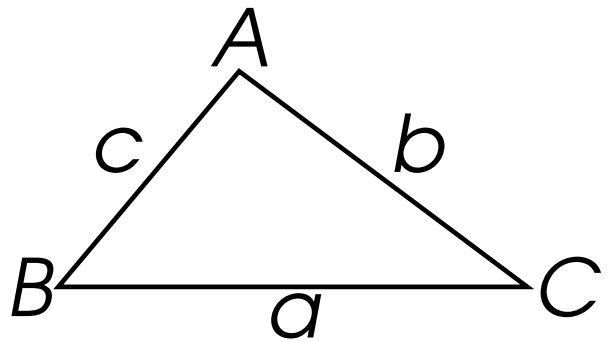
$b + c > a$
$10 + 8 > a$
$18 > a$

$a + c > b$
$a + 8 > 10$
$a + 8 - 8 > 10 - 8$
$a > 2$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

3. $b = 10, c = 8$



$a + b > c$
$a + 10 > 8$
$a + 10 - 10 > 8 - 10$
$a > -2$

$b + c > a$
$10 + 8 > a$
$18 > a$

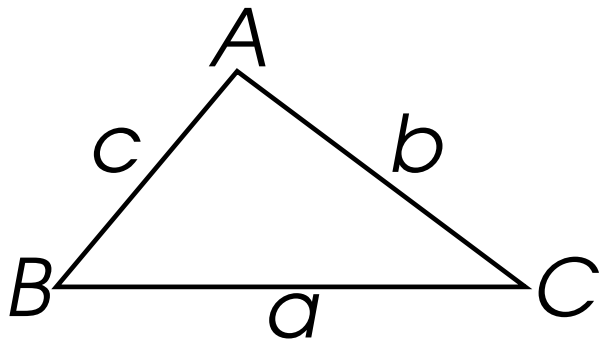
$a + c > b$
$a + 8 > 10$
$a + 8 - 8 > 10 - 8$
$a > 2$

$$\therefore 2 < a < 18$$

Example 5

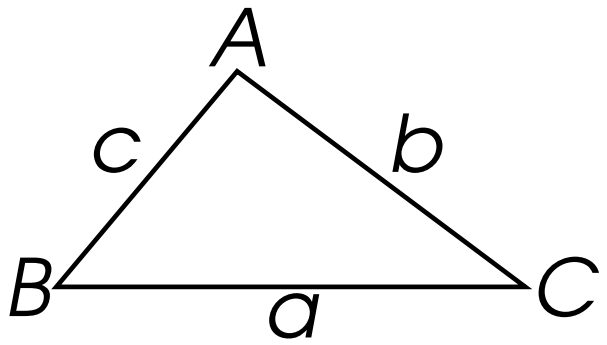
Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

4. $a = 3, b = 12$



Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

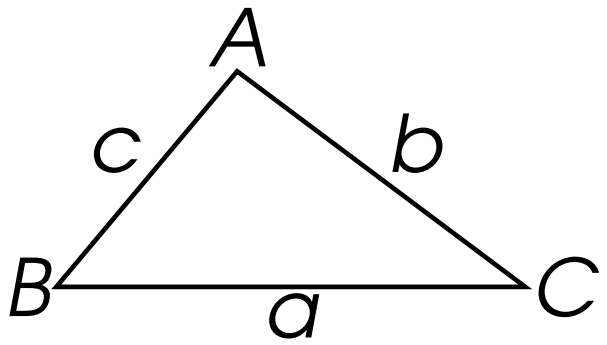


4. $a = 3, b = 12$

$a + b > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

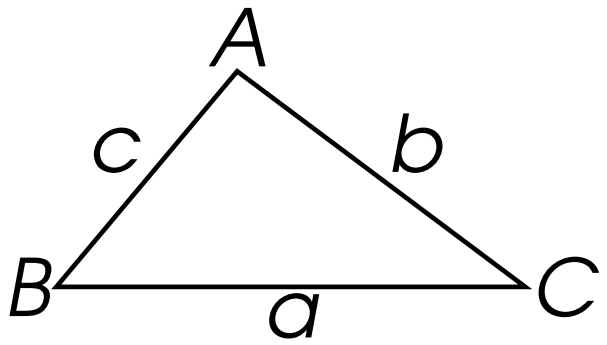


4. $a = 3, b = 12$

$a + b > c$
$3 + 12 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

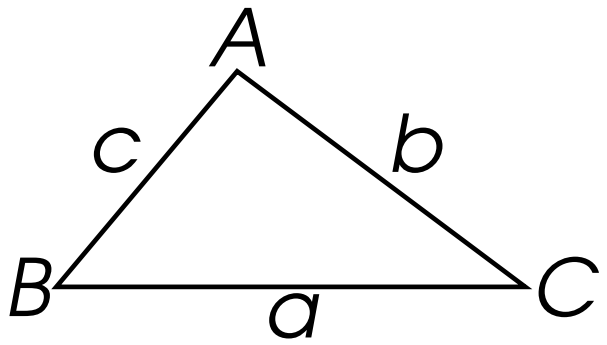


4. $a = 3, b = 12$

$a + b > c$
$3 + 12 > c$
$15 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

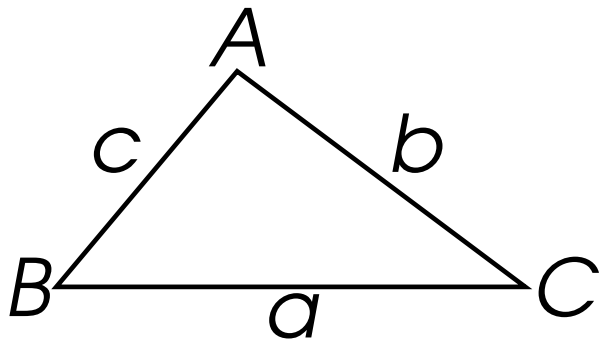


4. $a = 3, b = 12$

$a + b > c \qquad b + c > a$
$3 + 12 > c$
$15 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.



4. $a = 3, b = 12$

$a + b > c$ $\quad$ $b + c > a$

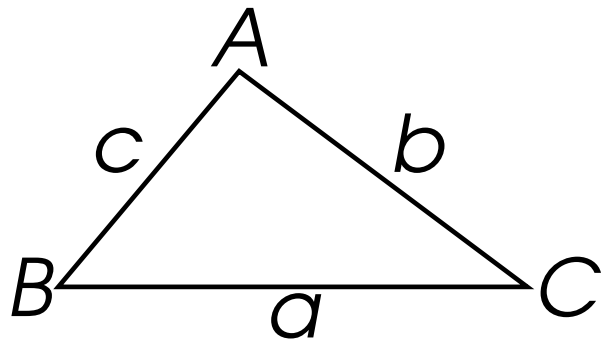
$3 + 12 > c$ $\quad$ $12 + c > 3$

$15 > c$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

4. $a = 3, b = 12$



$a + b > c$ $\quad$ $b + c > a$

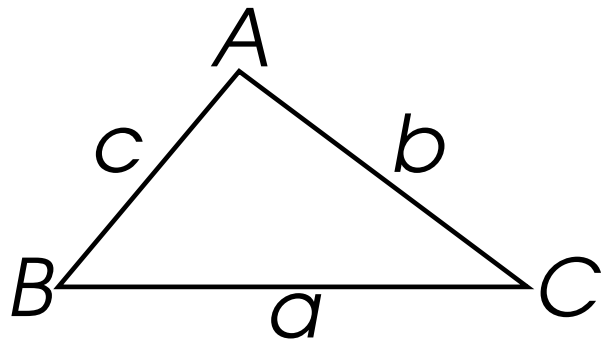
$3 + 12 > c$ $\quad$ $12 + c > 3$

$15 > c$ $\quad$ $12 - 12 + c > 3 - 12$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

4. $a = 3, b = 12$



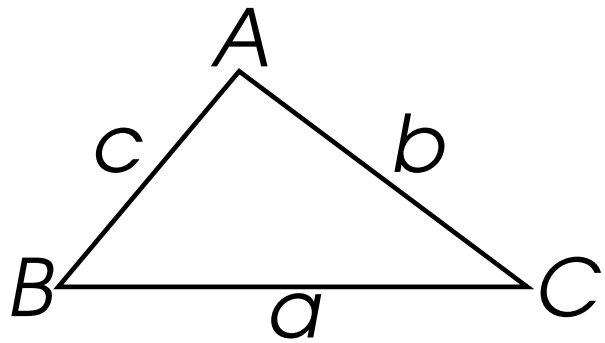
$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

4. $a = 3, b = 12$



$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

$a + c > b$

Example 5

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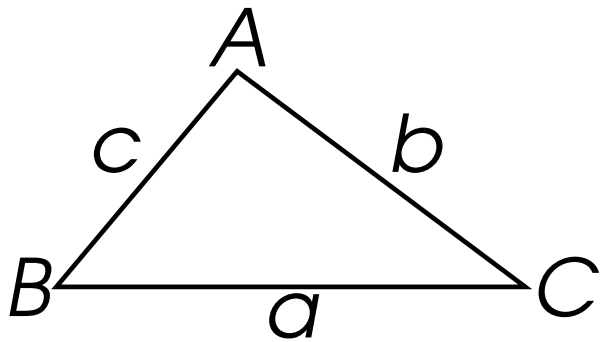

$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

$a + c > b$
$3 + c > 12$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

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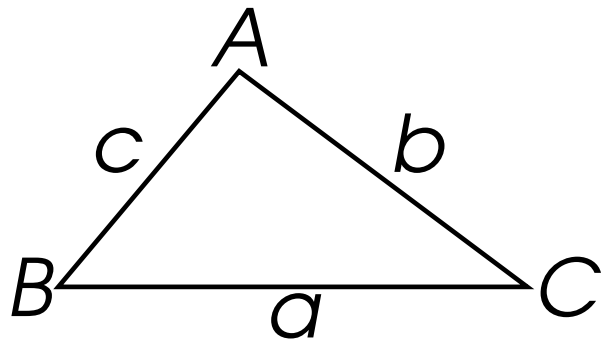

$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

$a + c > b$
$3 + c > 12$
$3 - 3 + c > 12 - 3$

Example 5

Using the Triangle Inequality theorem, find the range of possible measures for the third side of $\triangle ABC$.

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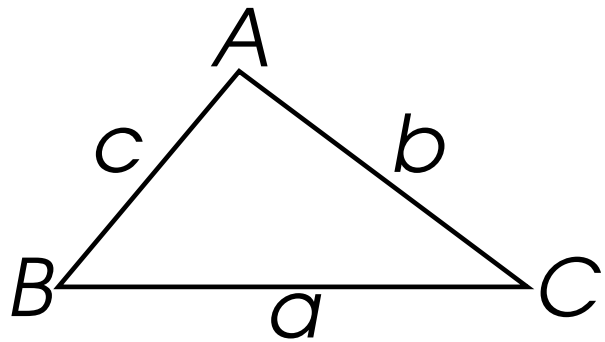

$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

$a + c > b$
$3 + c > 12$
$3 - 3 + c > 12 - 3$
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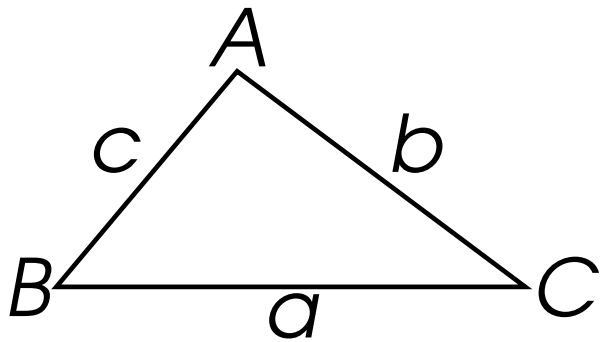


$a + b > c$
$3 + 12 > c$
$15 > c$

$b + c > a$
$12 + c > 3$
$12 - 12 + c > 3 - 12$
$c > -9$

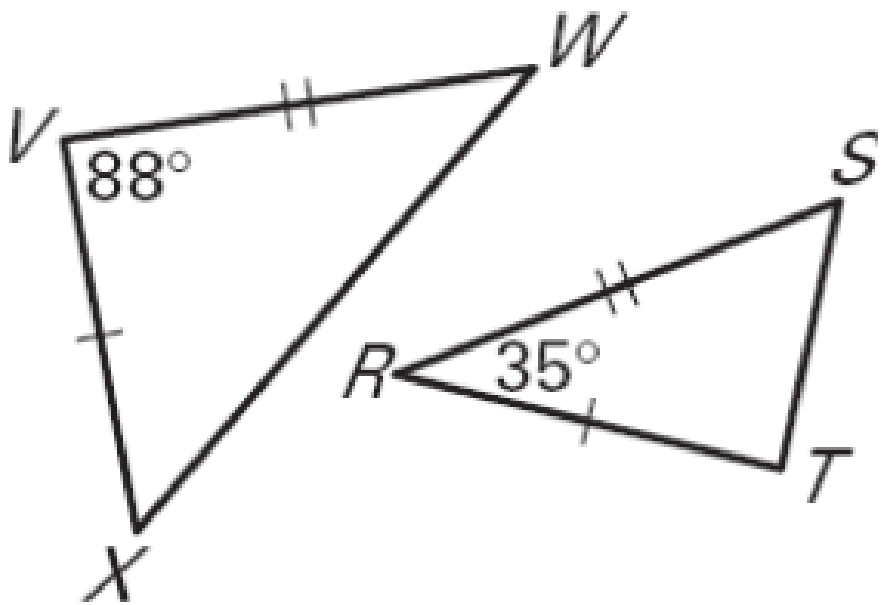
$a + c > b$
$3 + c > 12$
$3 - 3 + c > 12 - 3$
$c > 9$

$$\therefore 9 < c < 15$$

Example 6

Using the Hinge theorem, write $<$, $>$, or $=$ to relate the measures of the given pair of segments.

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



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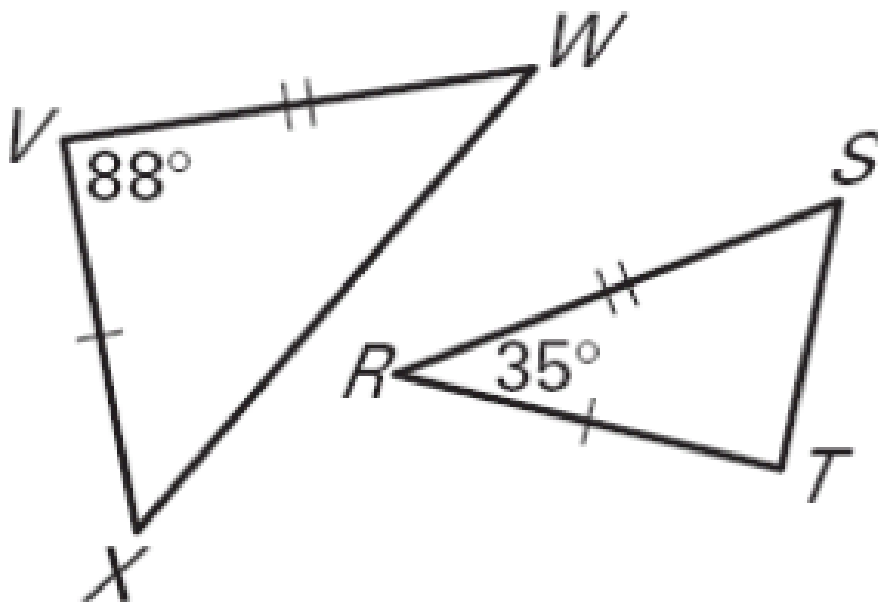
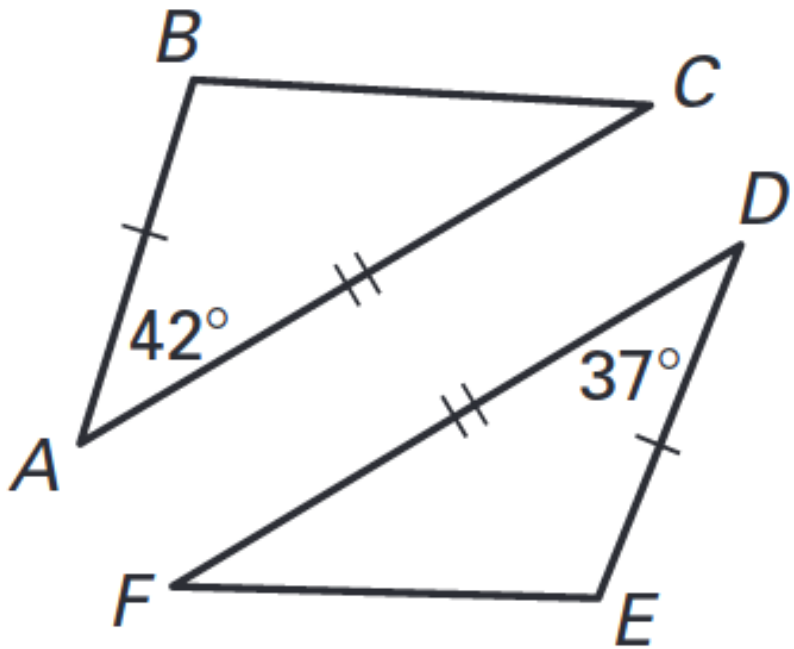


$$m\overline{WX} > m\overline{ST}$$

Example 6

Using the Hinge theorem, write $<$, $>$, or $=$ to relate the measures of the given pair of segments.

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



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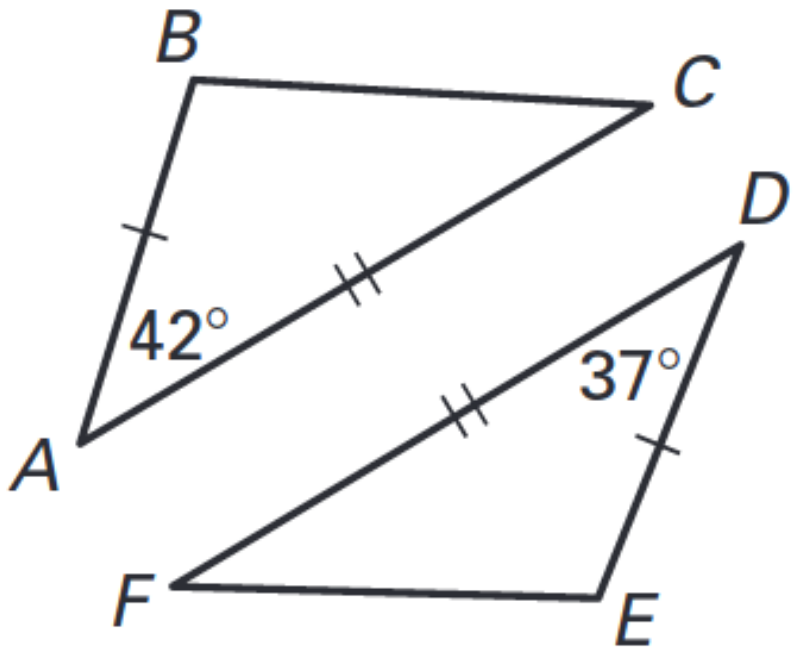
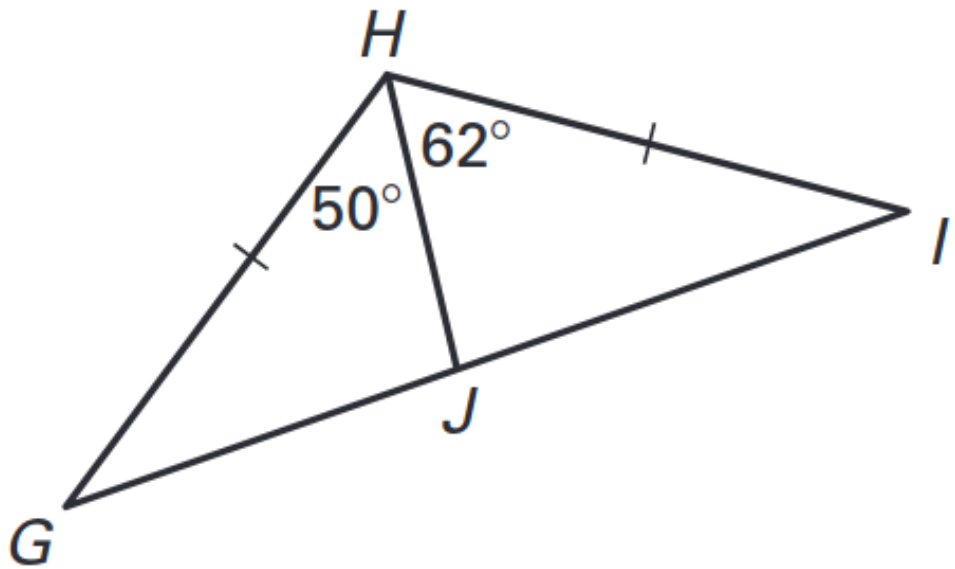


$m\overline{BC} > m\overline{EF}$

Example 6

Using the Hinge theorem, write $<$, $>$, or $=$ to relate the measures of the given pair of segments.

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



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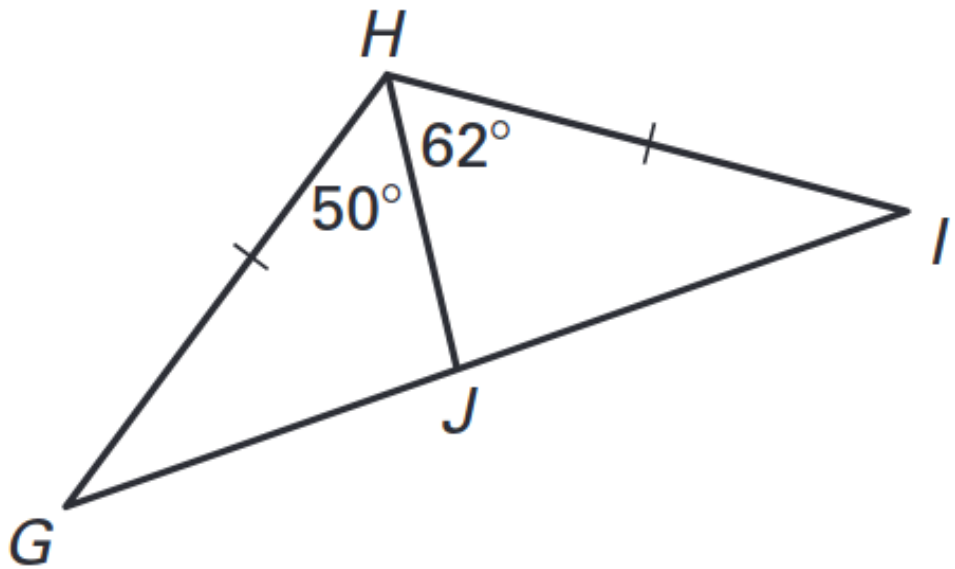
3. $\overline{JI}, \overline{JG}$



$m\overline{JI} > m\overline{JG}$

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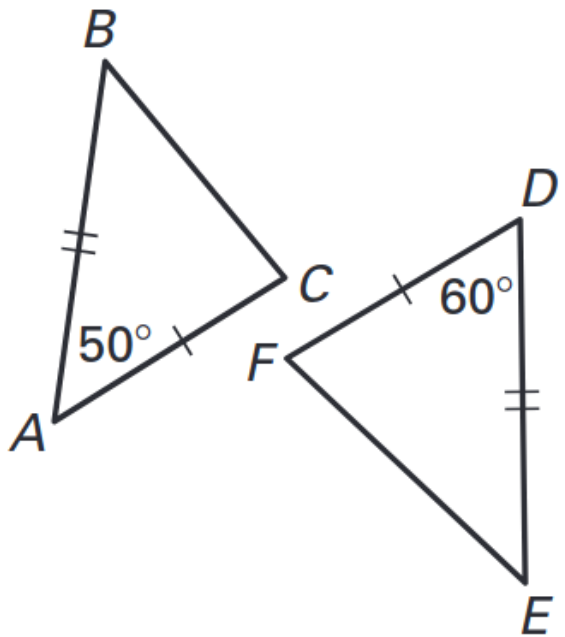

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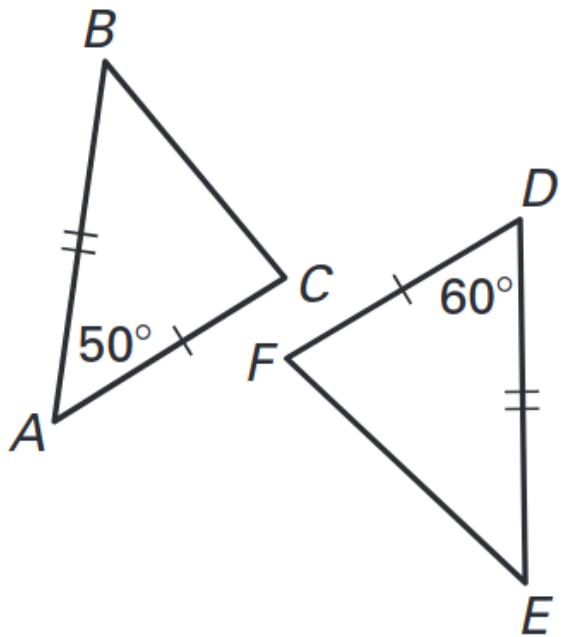
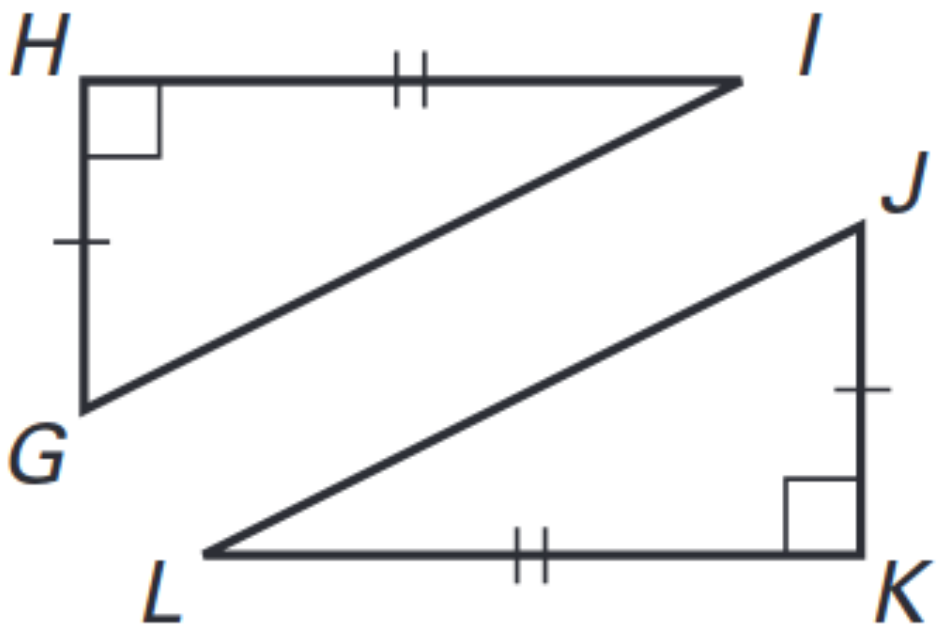


$m\overline{BC} < m\overline{EF}$

Example 6

Using the Hinge theorem, write $<$, $>$, or $=$ to relate the measures of the given pair of segments.

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



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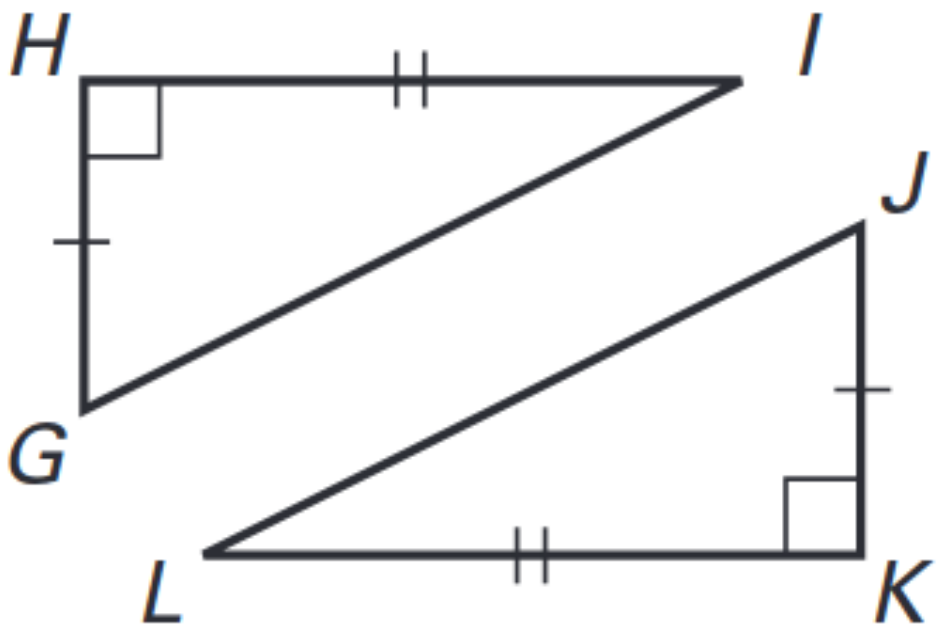
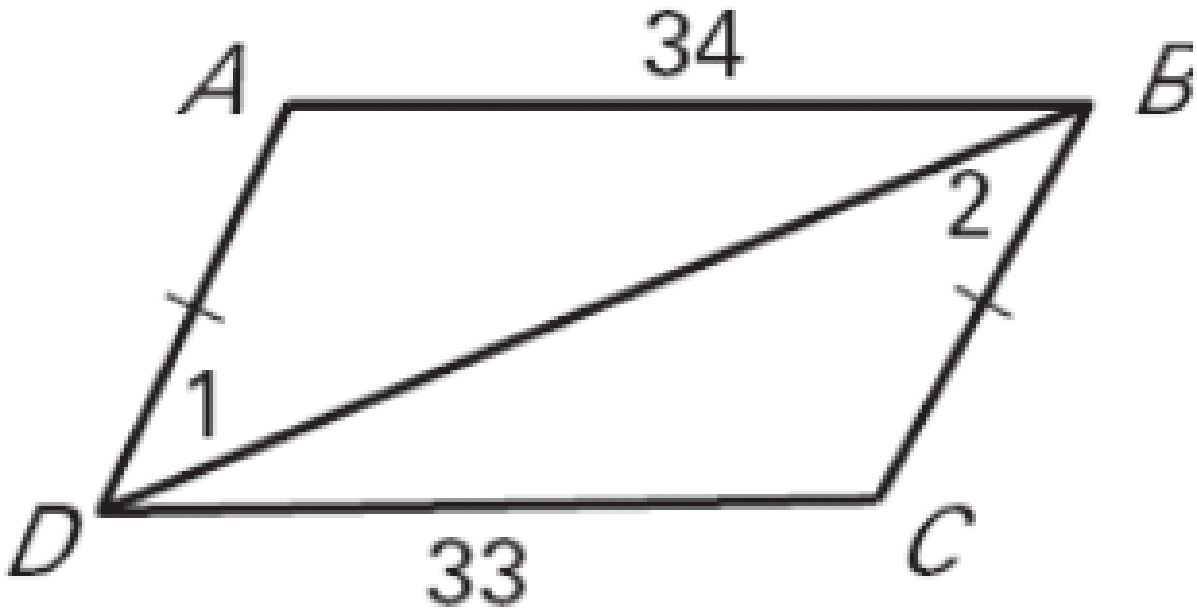


$m\overline{IG} = m\overline{LJ}$

Example 7

Using the Converse of Hinge theorem, write $<, >$, or $=$ to relate the measures of the given pair of angles.

1. $\angle 1, \angle 2$



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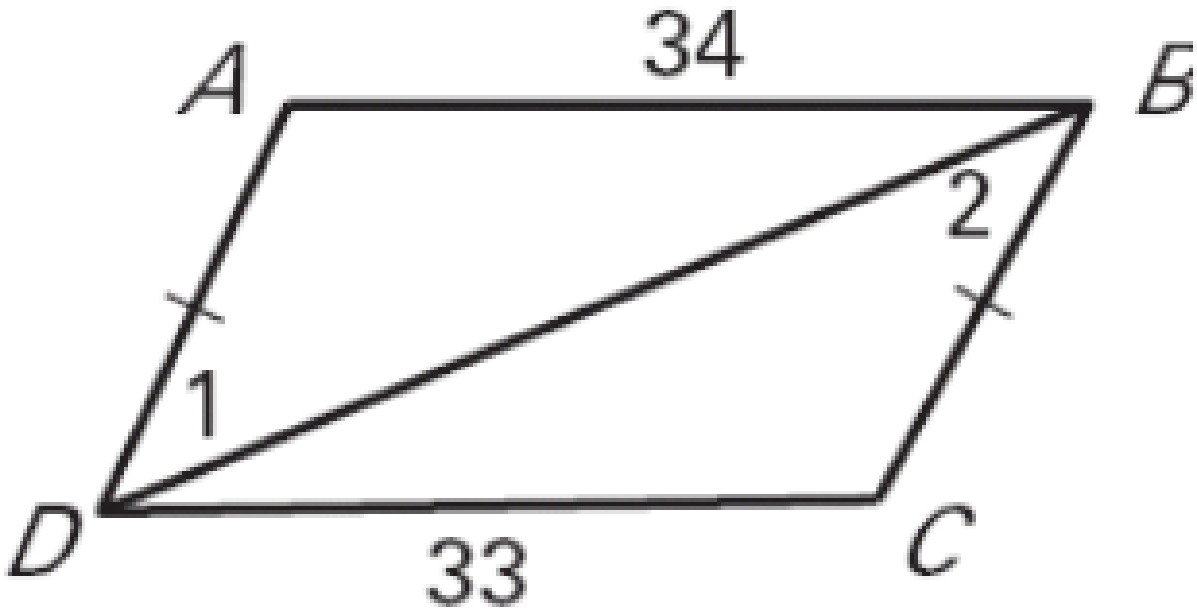
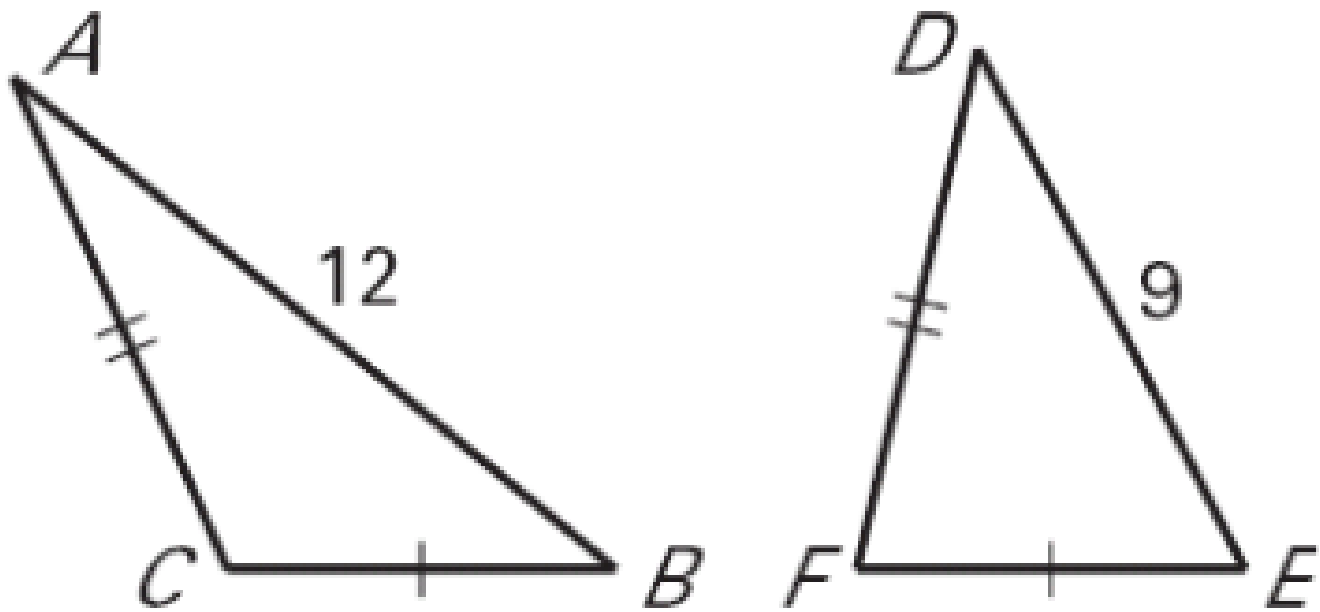


$m\angle 1 > m\angle 2$

Example 7

Using the Converse of Hinge theorem, write $<, >$, or $=$ to relate the measures of the given pair of angles.

2. $\angle C, \angle F$



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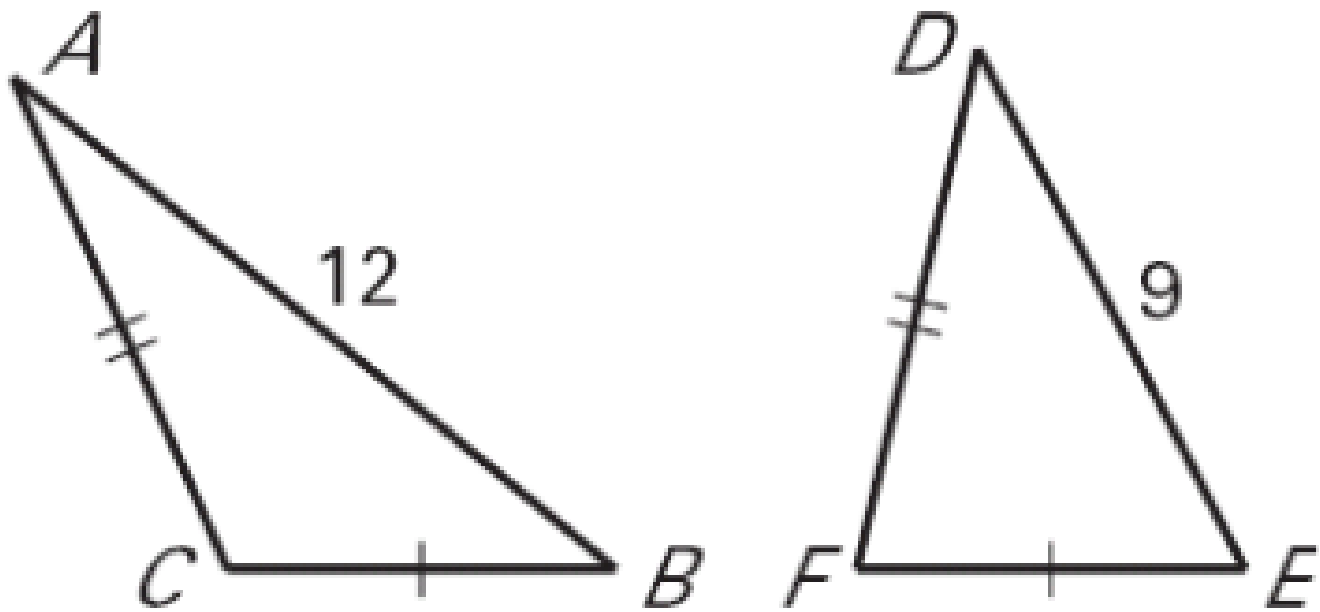
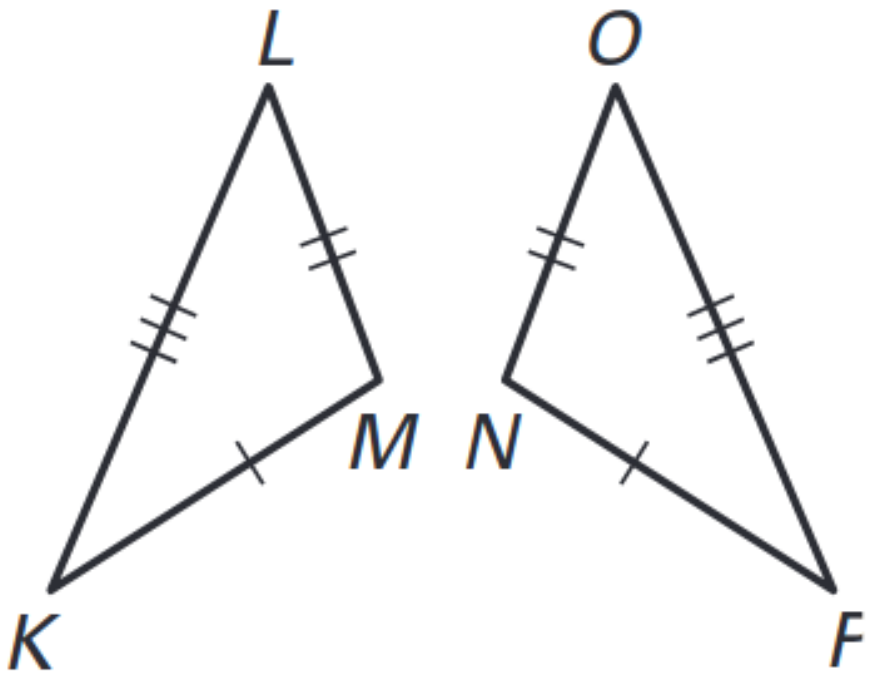


$m\angle C > m\angle F$

Example 7

Using the Converse of Hinge theorem, write $<$, $>$, or $=$ to relate the measures of the given pair of angles.

3. $\angle M, \angle N$



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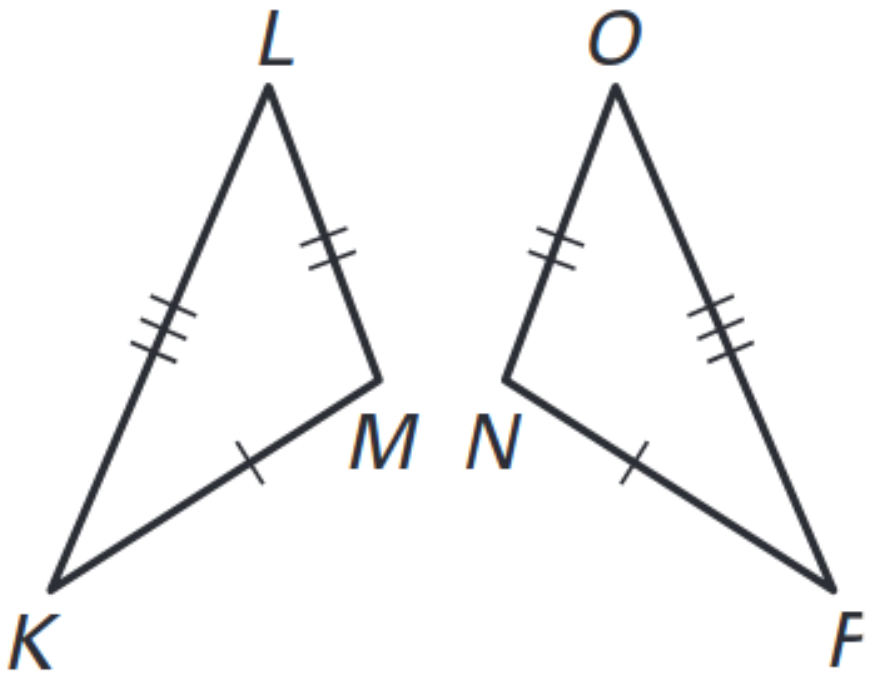
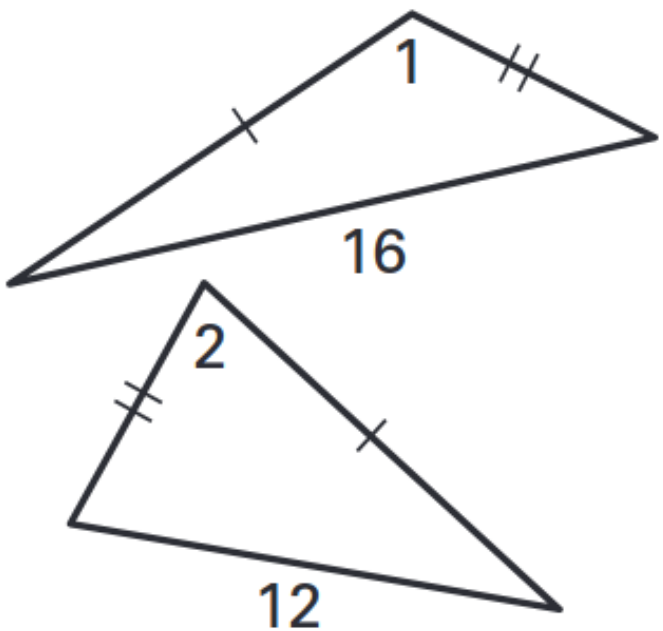


$m\angle M = m\angle N$

Example 7

Using the Converse of Hinge theorem, write $<, >$, or $=$ to relate the measures of the given pair of angles.

4. $\angle 1, \angle 2$



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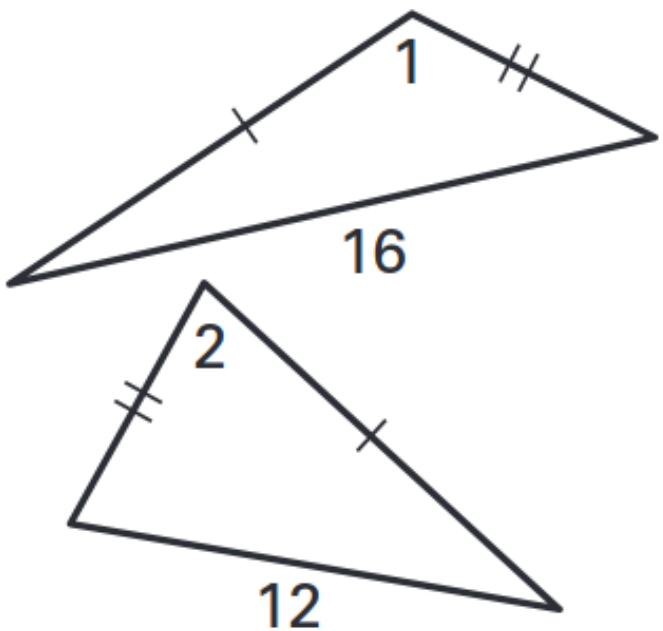
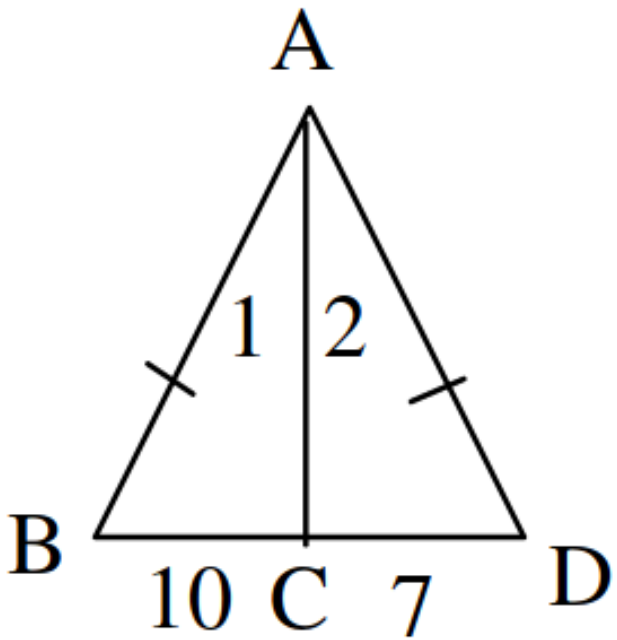


$m\angle 1 > m\angle 2$

Example 7

Using the Converse of Hinge theorem, write $<, >$, or $=$ to relate the measures of the given pair of angles.

5. $\angle 1, \angle 2$



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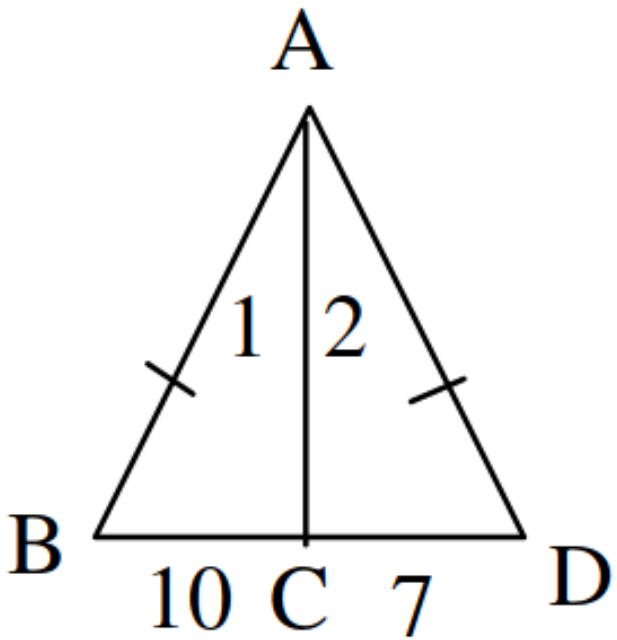
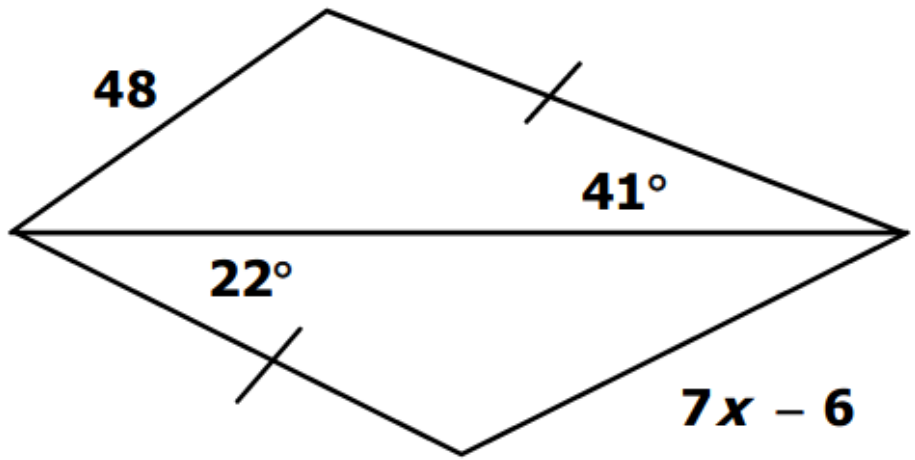


$m\angle 1 > m\angle 2$

Example 8

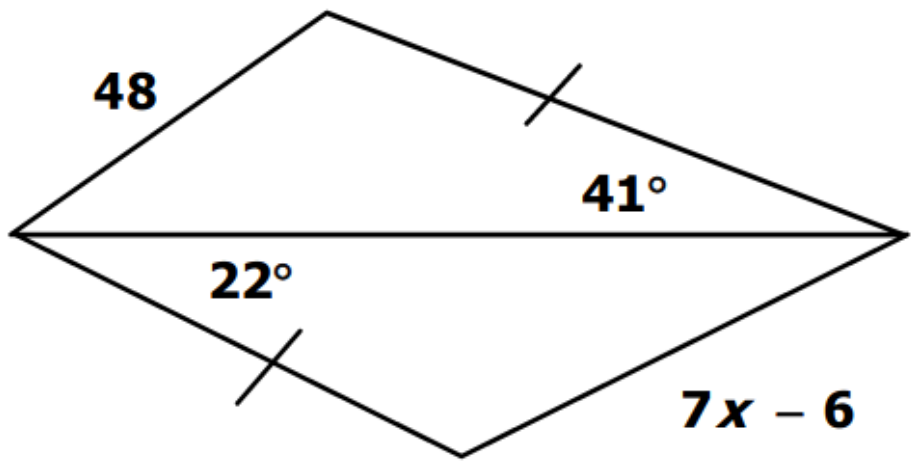
Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.



Example 8

Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

1. $48 > 7x - 6$



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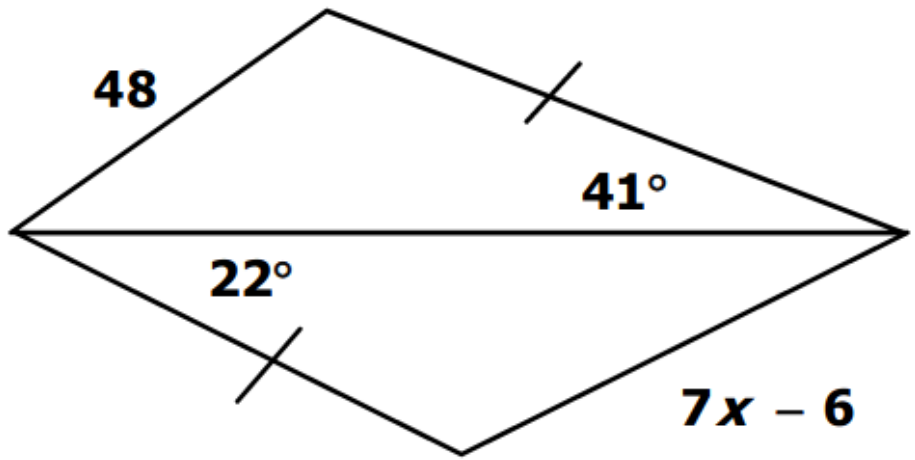
Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

1. $48 > 7x - 6$

$-7x + 48 - 48 > 7x - 7x - 6 - 48$



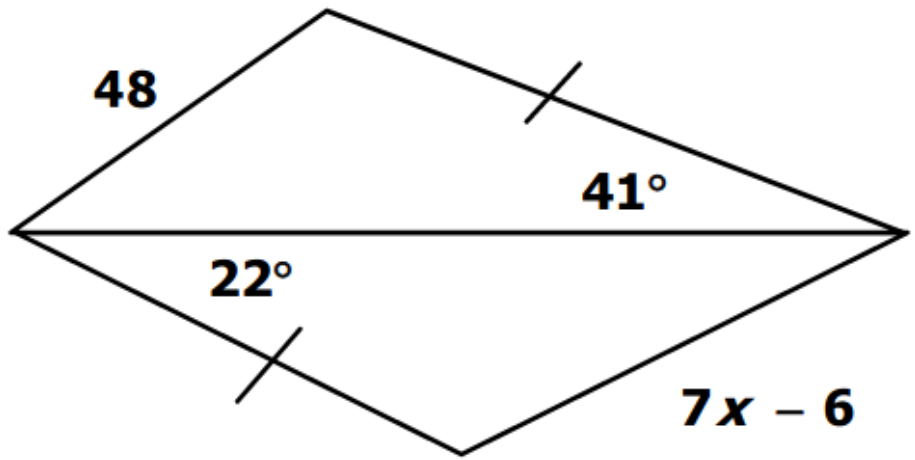
Example 8

Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

1. $48 > 7x - 6$

$-7x + 48 - 48 > 7x - 7x - 6 - 48$

$-7x > -54$



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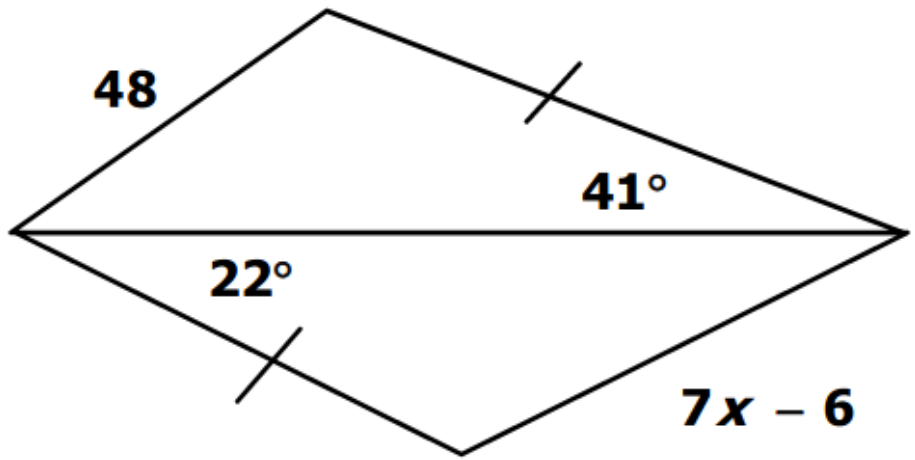
1. $48 > 7x - 6$

$$-7x + 48 - 48 > 7x - 7x - 6 - 48$$
$$-7x > -54$$
$$\frac{-7x}{-7} > \frac{-54}{-7}$$



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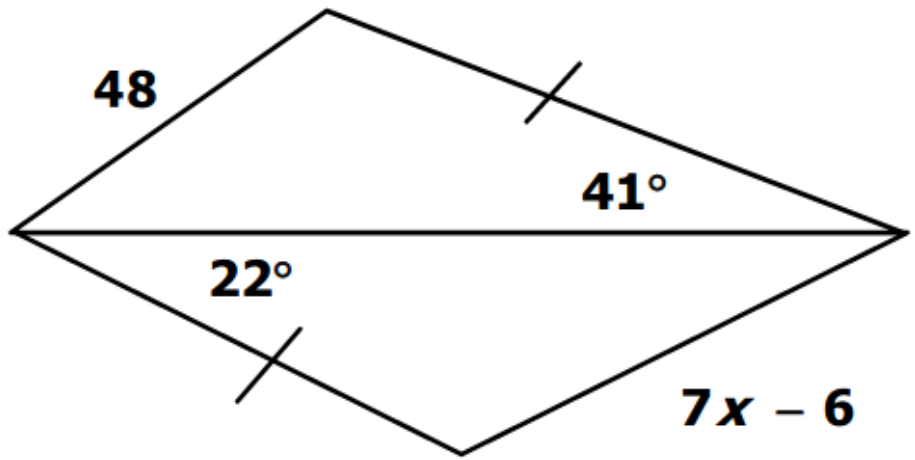
1. $48 > 7x - 6$

$$-7x + 48 - 48 > 7x - 7x - 6 - 48$$
$$-7x > -54$$
$$\frac{-7x}{-7} > \frac{-54}{-7}$$
$$x < \frac{54}{7}$$



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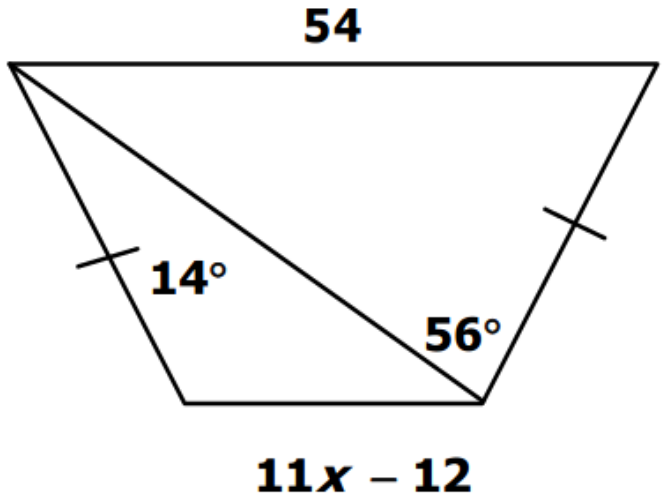

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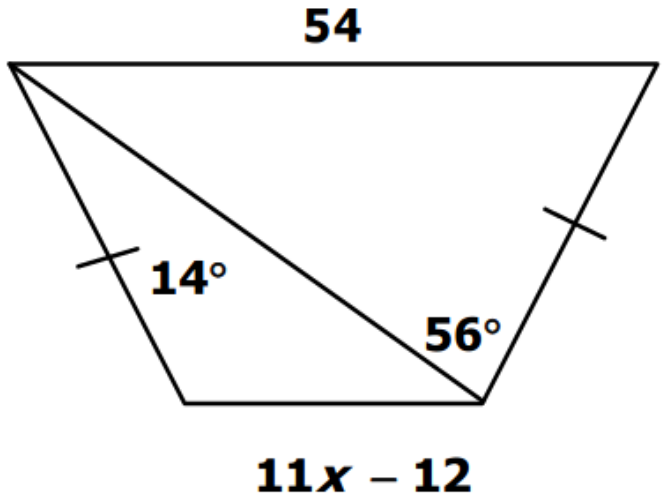
Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

2. $54 > 11x - 12$



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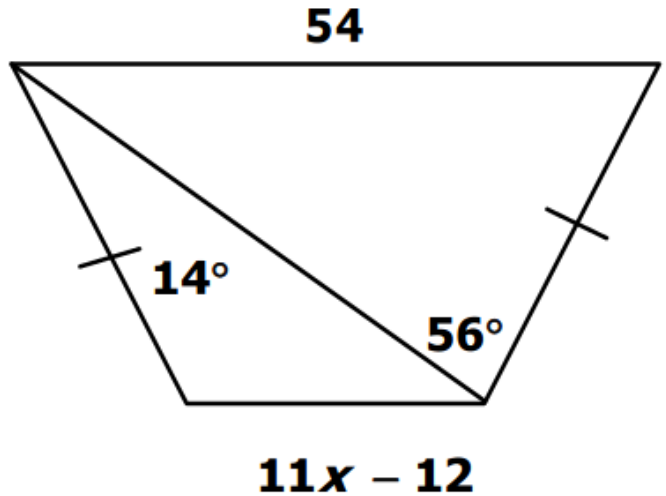

2. $54 > 11x - 12$

$-11x + 54 - 54 > 11x - 11x - 12 - 54$

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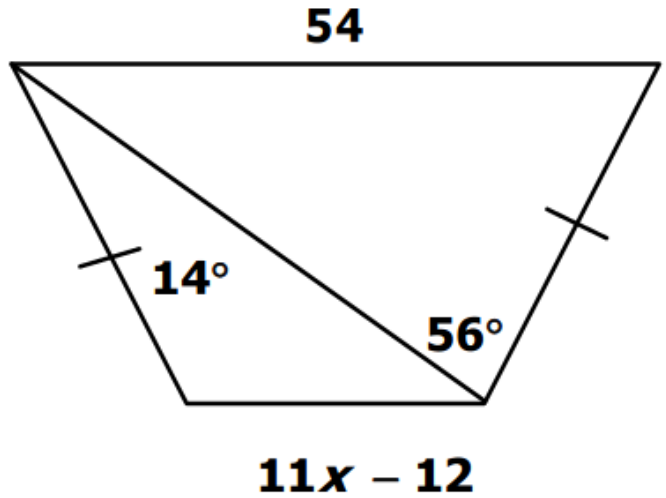

2. $54 > 11x - 12$

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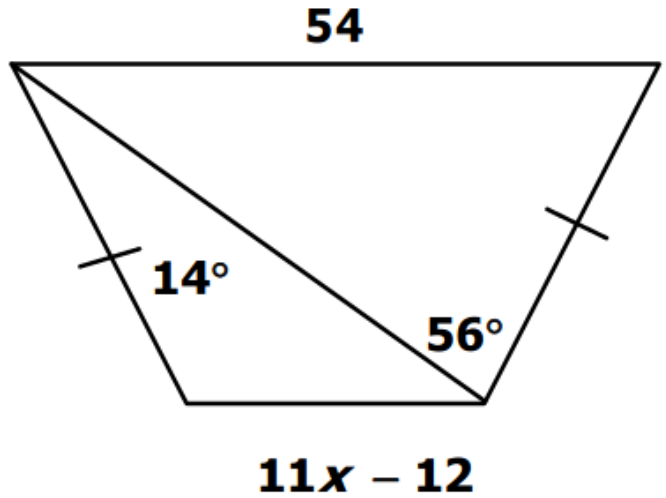

2. $54 > 11x - 12$

$$-11x + 54 - 54 > 11x - 11x - 12 - 54$$

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$$\frac{-11x}{-11} > \frac{-66}{-11}$$

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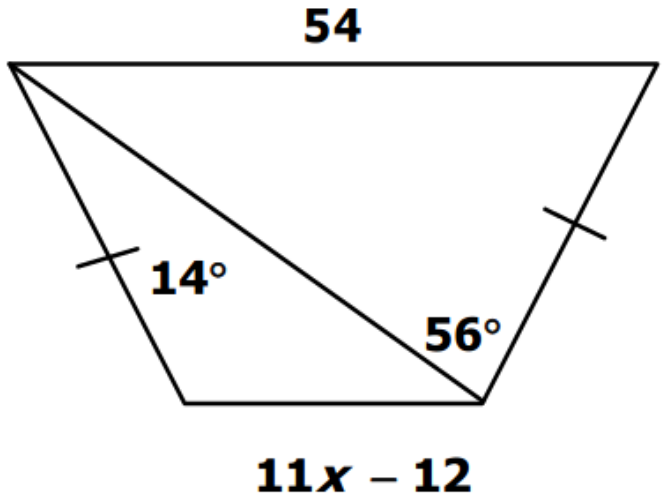
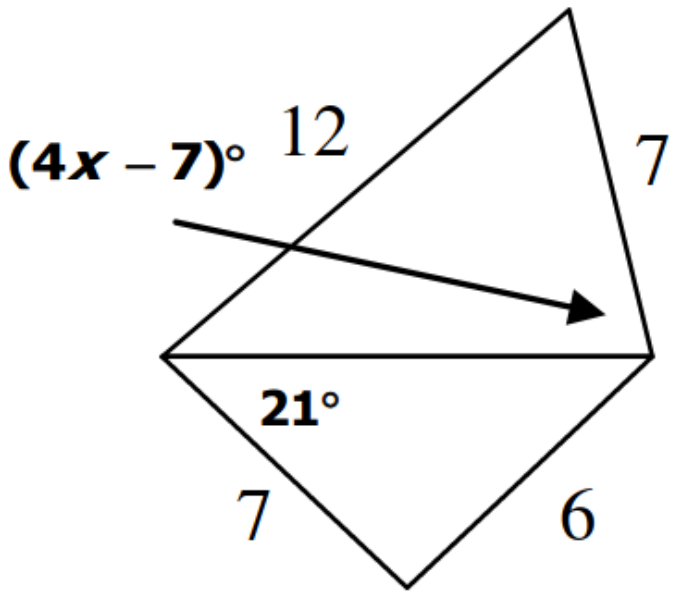


2. $54 > 11x - 12$

$$-11x + 54 - 54 > 11x - 11x - 12 - 54$$
$$-11x > -66$$
$$\frac{-11x}{-11} > \frac{-66}{-11}$$
$$x < 6$$

Example 8

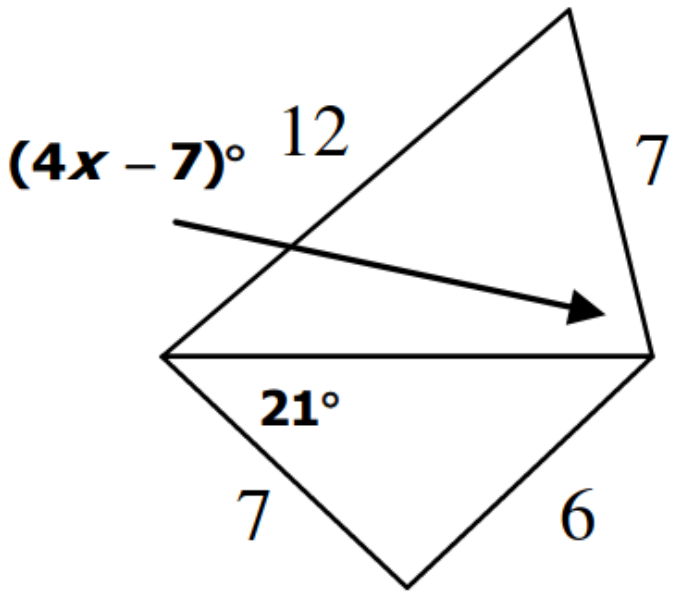
Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.



Example 8

Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

3. $4x - 7 > 21$



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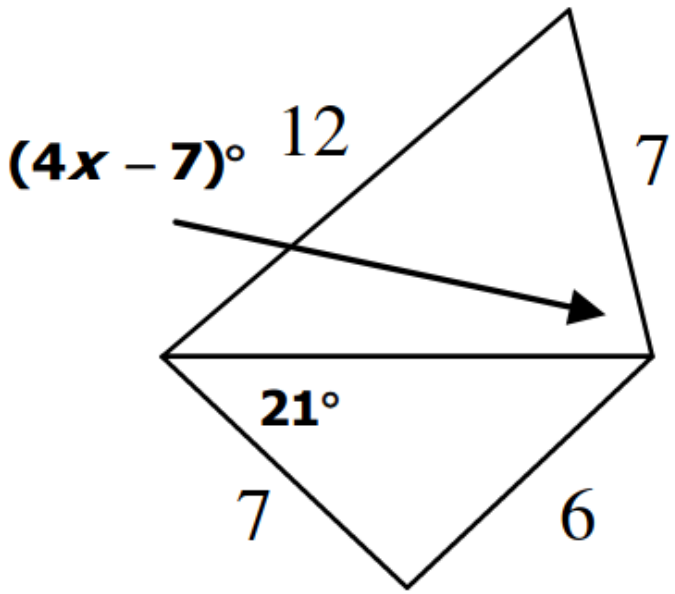

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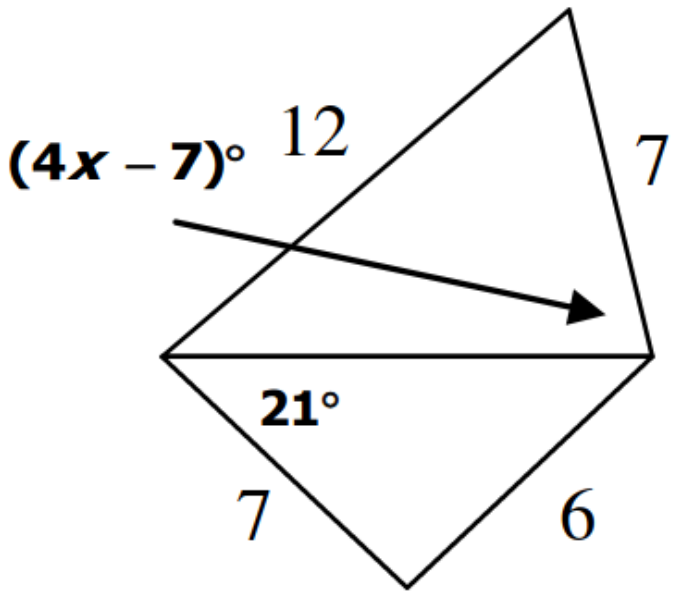

3. $4x - 7 > 21$

$4x - 7 + 7 > 21 + 7$
$4x > 28$

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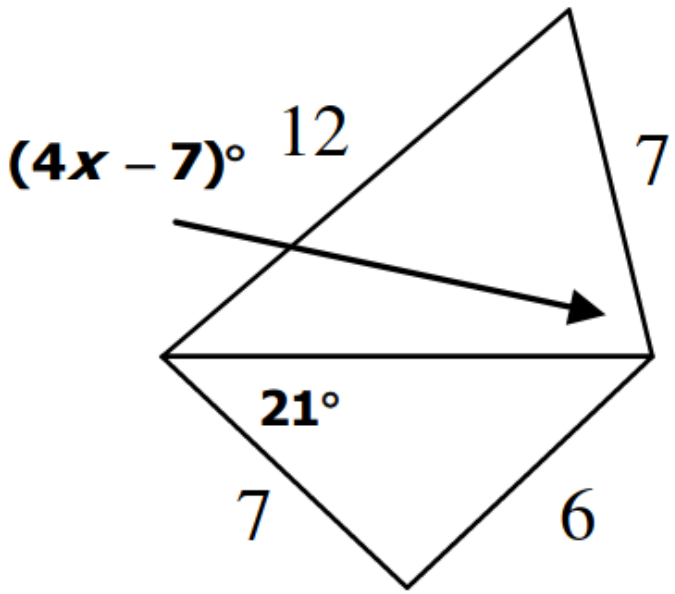

3. $4x - 7 > 21$

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$4x > 28$

$\frac{4x}{4} > \frac{28}{4}$

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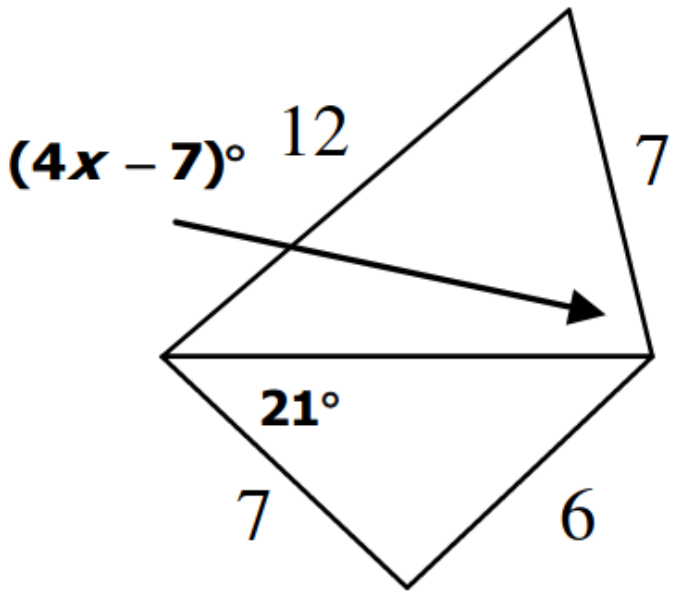

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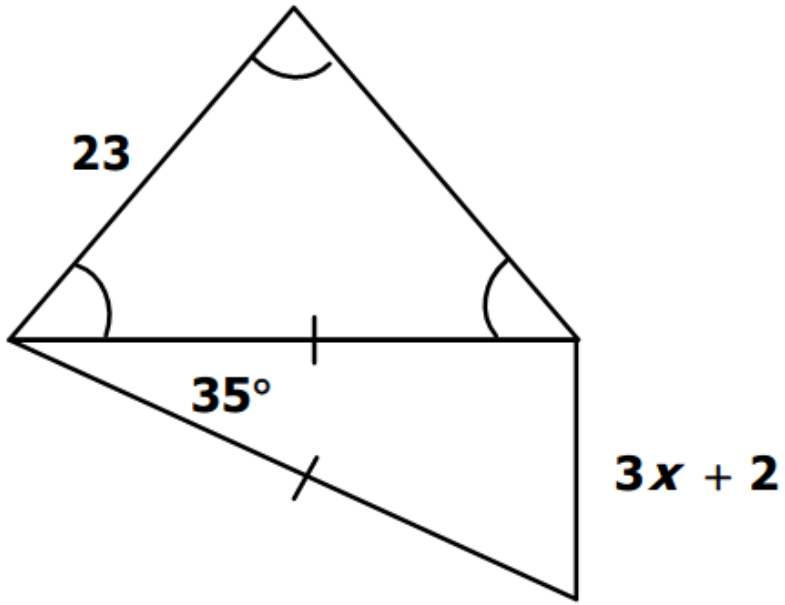

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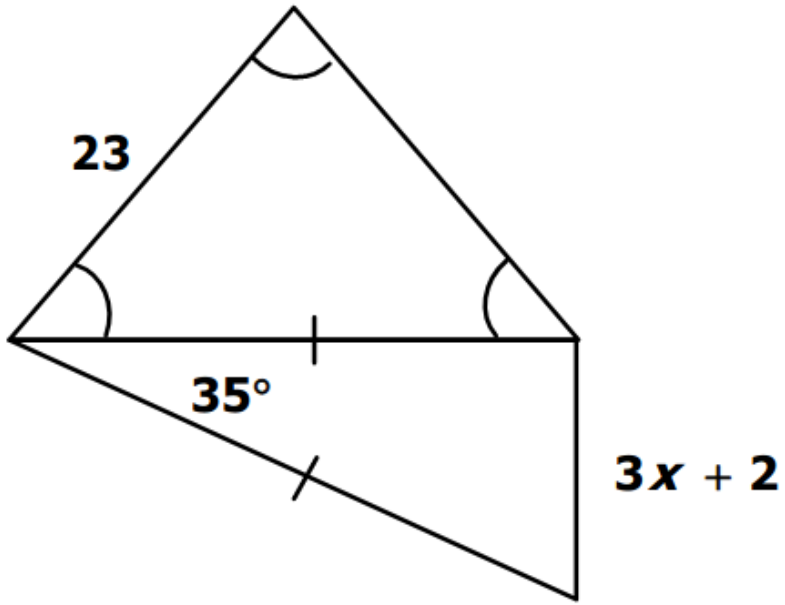
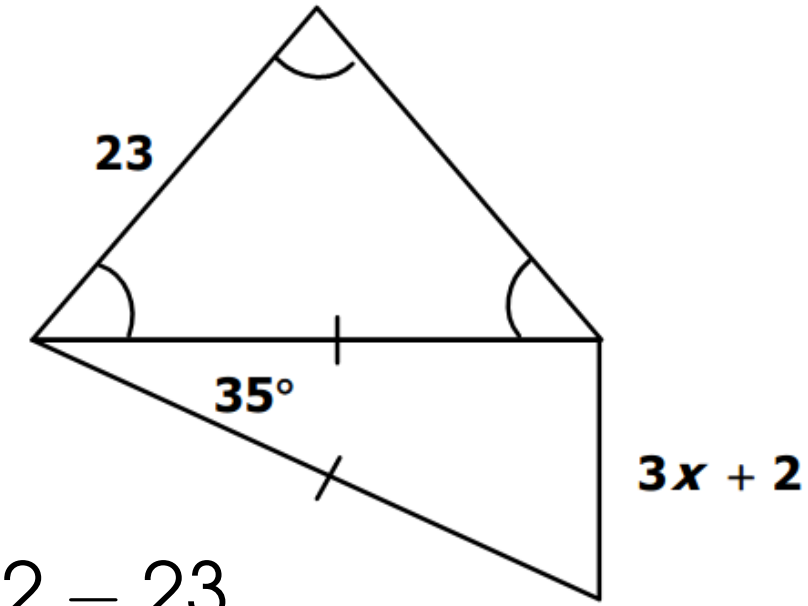


4. $23 > 3x + 2$

Example 8

Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.



4. $23 > 3x + 2$

$-3x + 23 - 23 > 3x - 3x + 2 - 23$

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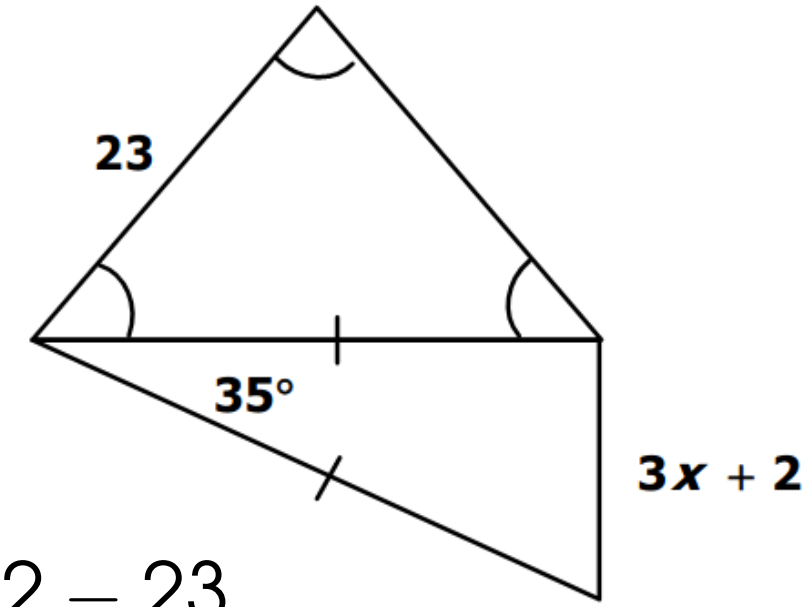

4. $23 > 3x + 2$

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$-3x > -21$

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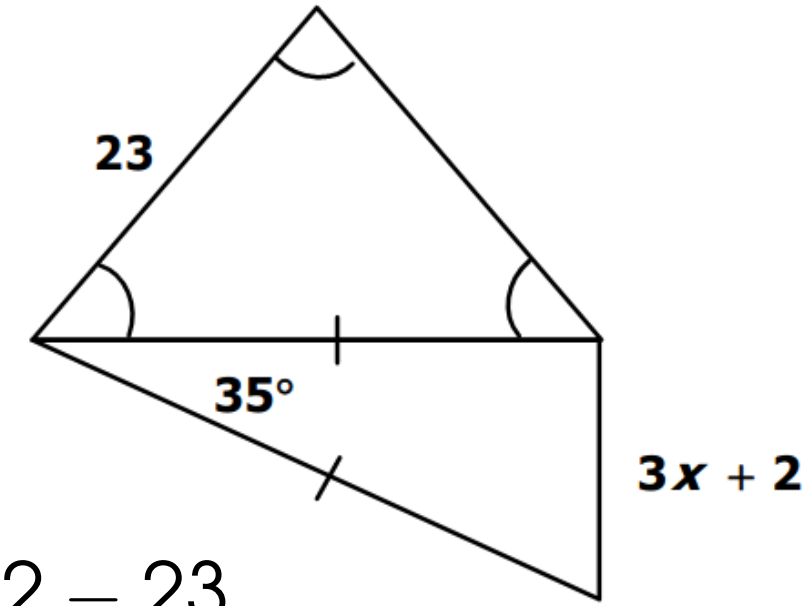

4. $23 > 3x + 2$

$$-3x + 23 - 23 > 3x - 3x + 2 - 23$$
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$$\frac{-3x}{-3} > \frac{-21}{-3}$$

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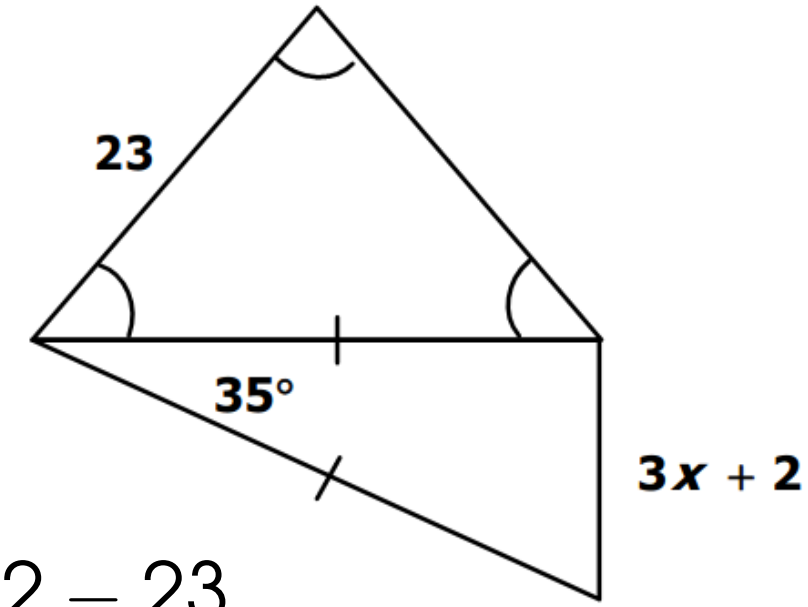

4. $23 > 3x + 2$

$$-3x + 23 - 23 > 3x - 3x + 2 - 23$$
$$-3x > -21$$
$$\frac{-3x}{-3} > \frac{-21}{-3}$$
$$x < 7$$

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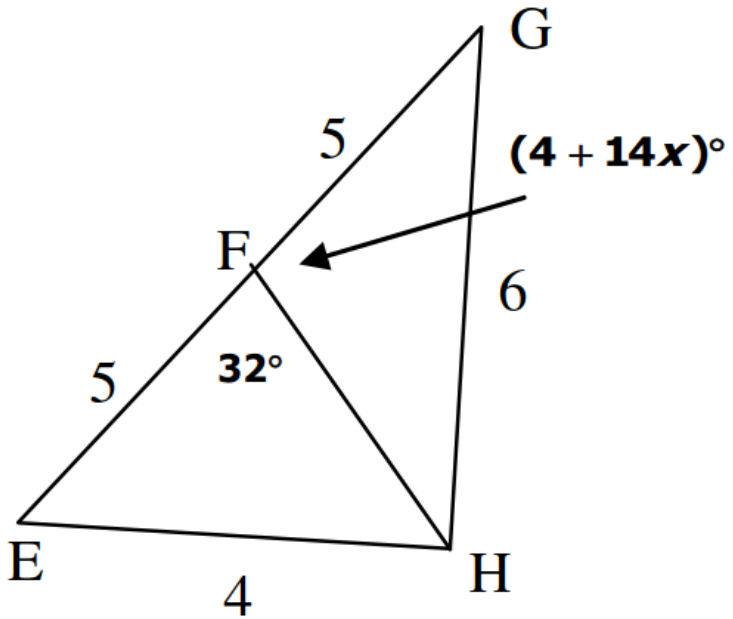

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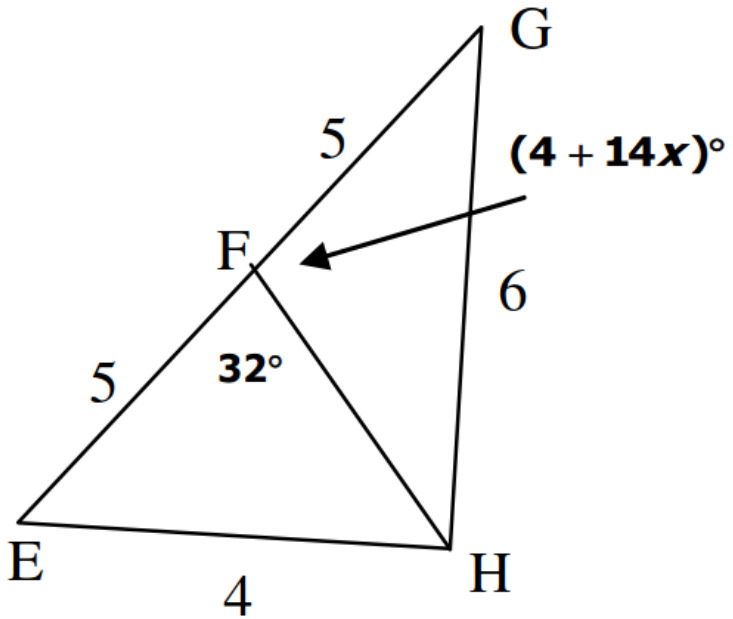
Using the Hinge theorem or its converse, write an inequality to describe the possible values of x.

5. $4 + 14x > 32$



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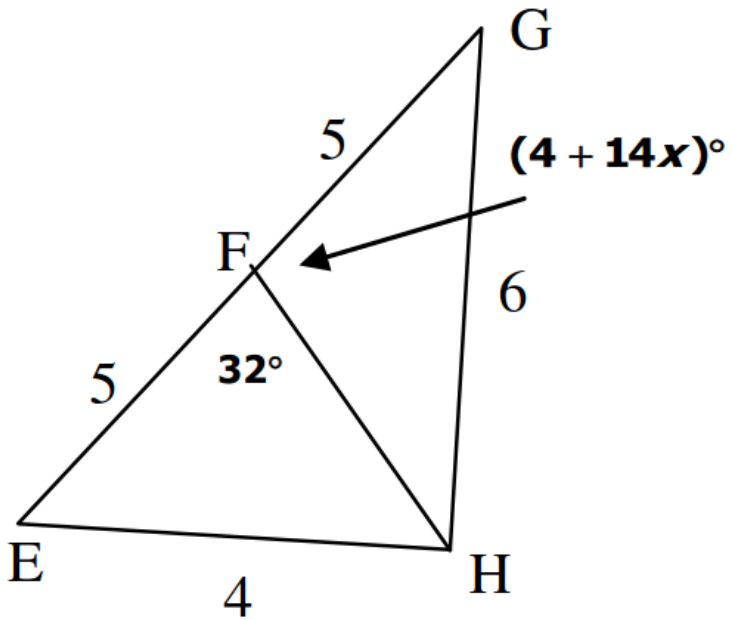

5. $4 + 14x > 32$

$4 - 4 + 14x > 32 - 4$

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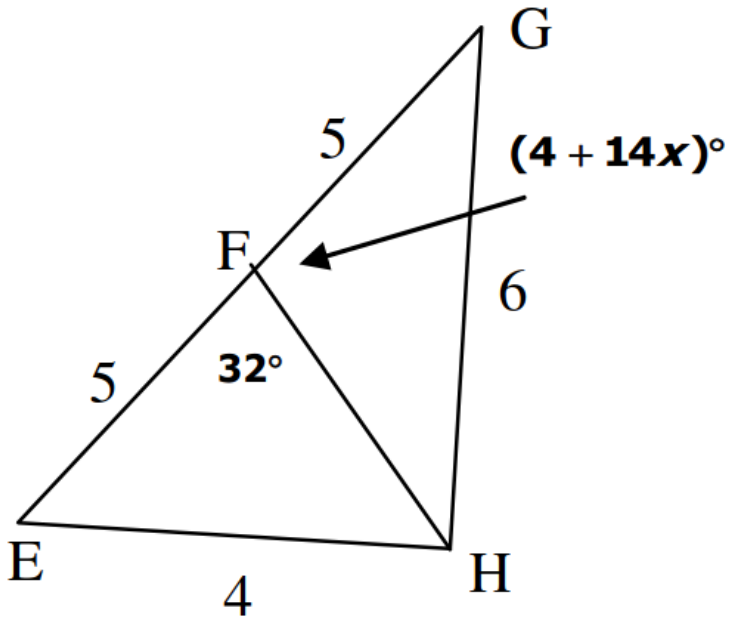

5. $4 + 14x > 32$

$4 - 4 + 14x > 32 - 4$

$14x > 28$

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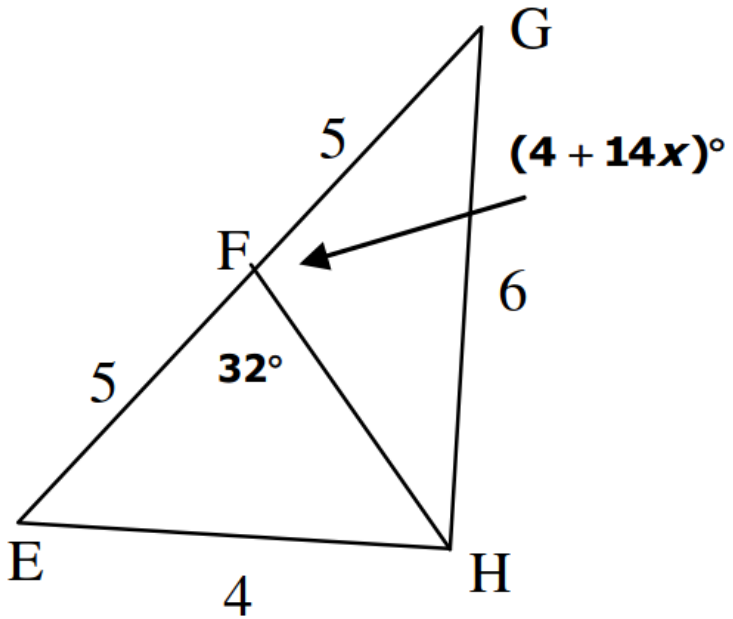

5. $4 + 14x > 32$

$4 - 4 + 14x > 32 - 4$

$14x > 28$

$\frac{14x}{14} > \frac{28}{14}$

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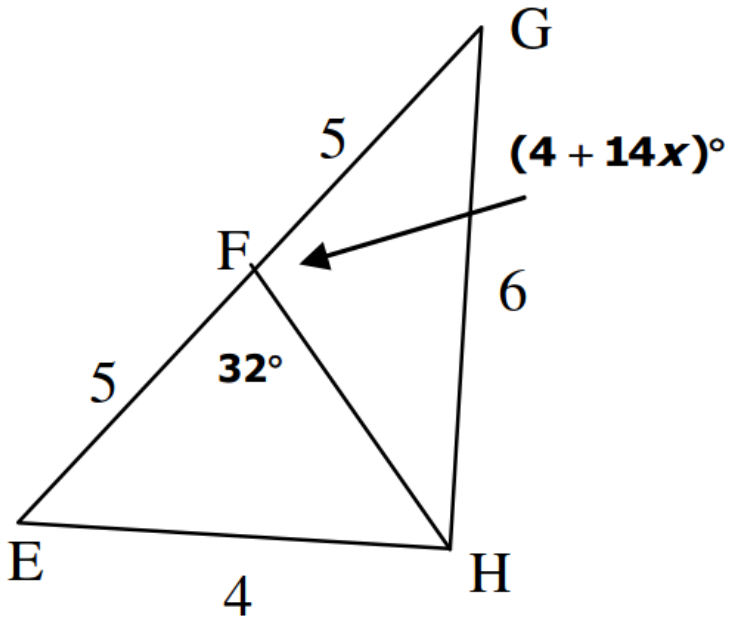

5. $4 + 14x > 32$

$4 - 4 + 14x > 32 - 4$

$14x > 28$

$\frac{14x}{14} > \frac{28}{14}$

$x > 2$

Thank you for attending the virtual class.