LESSON 5.5

NAME _____ DATE _____

Reteaching with Practice

For use with pages 295–301

GOAL **Compare measurements of a triangle to decide which side is longest or which angle is largest and use the Triangle Inequality**

VOCABULARY

Theorem 5.10
If one side of a triangle is longer than another side, then the angle opposite the longer side is larger than the angle opposite the shorter side.

Theorem 5.11
If one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.

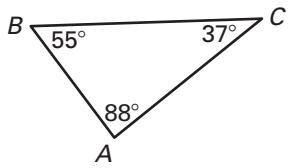
Theorem 5.12 Exterior Angle Inequality
The measure of an exterior angle of a triangle is greater than the measure of either of the two nonadjacent interior angles.

Theorem 5.13 Triangle Inequality
The sum of the lengths of any two sides of a triangle is greater than the length of the third side.

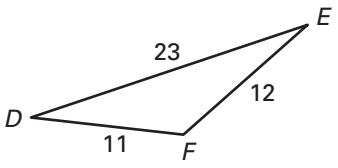
EXAMPLE 1 *Writing Measurements in Order from Least to Greatest*

Write the measurements of the triangle in order from least to greatest.

a.



b.



SOLUTION

a. $m\angle C < m\angle B < m\angle A$

$AB < AC < BC$

b. $DF < EF < DE$

$m\angle E < m\angle D < m\angle F$

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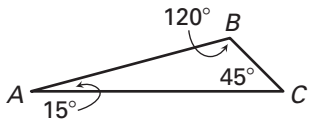
Exercises for Example 1

Write the measurements of the triangle in order from least to greatest.

1.



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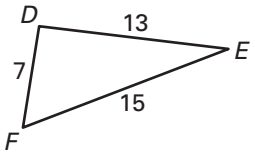

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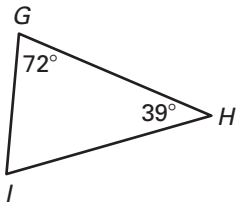

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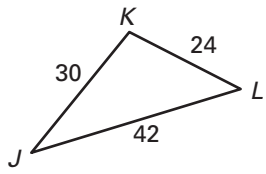

EXAMPLE 2 Finding Possible Side Lengths

A triangle has one side of 12 inches and another side of 16 inches. Describe the possible lengths of the third side.

SOLUTION

Let x represent the length of the third side. Using the Triangle Inequality, you can write and solve inequalities.

$$x + 12 > 16 \qquad 16 + 12 > x$$
$$x > 4 \qquad 28 > x$$

So, the length of the third side must be greater than 4 inches and less than 28 inches.

Exercises for Example 2

Two sides of a triangle are given. Describe the possible lengths of the third side.

5. 2 centimeters and 5 centimeters

6. 7 inches and 12 inches

7. 4 feet and 10 feet

8. 11 meters and 10 meters

9. 9 inches and 25 inches

10. 1 mile and 8 miles