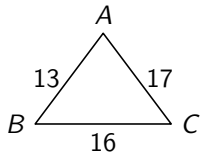
Inequalities in One Triangle

Today I Can

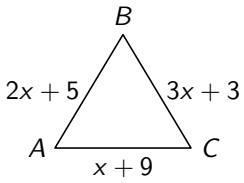
1. Write and solve inequalities for angles and sides of a triangle.

The longer the side of a triangle, the larger the angle opposite that side; and vice versa.

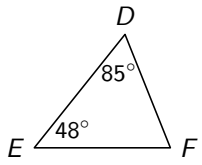
Example 1. Put the angles of the triangle in order from least to greatest.



Example 2. If the perimeter of the triangle below is 47, Find the measure of the largest angle.



Example 3. Put the sides of the triangle in order from shortest to longest.



Example 4. List the sides of $\triangle ABC$ in order from shortest to longest given the following angle measures:

$$m\angle A = 9x - 4, \quad m\angle B = 4x - 16, \quad m\angle C = 68 - 2x$$

Triangle Inequality Theorem

Any 2 sides of a triangle added together must be longer than the 3rd side.

Example 5. Can a triangle have sides with the given lengths? Explain.

(a) 3 ft, 7 ft, 8 ft

(b) 5 ft, 10 ft, 15 ft

Example 6. Find the range of possible lengths for the third side in each.

(a) Two sides of a triangle are 9 yd and 4 yd

(b) Two sides of a triangle are 4 ft and 7 ft