Day 2 – Triangles and Triangle Inequalities
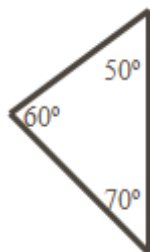
Triangles can be classified by two categories: **by Angles and by Sides.**
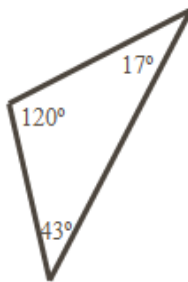
ANGLES
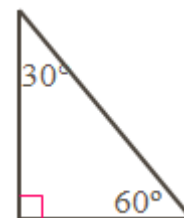
Acute	Obtuse	Right

All Acute Angles	One Obtuse Angle	One Right Angle

SIDES

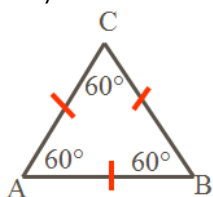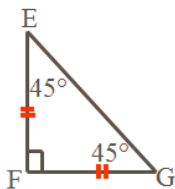| Scalene	Isosceles	Equilateral

No Sides Congruent	At Least 2 Sides Congruent	All Sides Congruent

Practice: Classify the triangles by sides and angles. **Think About It:** Check which triangles are possible.


	Acute	Obtuse	Right
Scalene			
Isosceles			
Equilateral			

Side Inequality Theorem

Side Inequality Theorem: If one side of a triangle is longer than the other side, then the angle opposite the longer side has a greater measure than the angle opposite the shorter side.

This means: The largest angle of a triangle lies opposite the longest side. The smallest angle lies opposite the shortest side. If two angles are equal, their side lengths will be equal.

Example: List the sides from shortest to longest for each diagram.
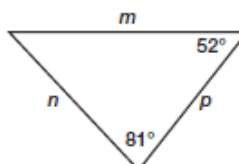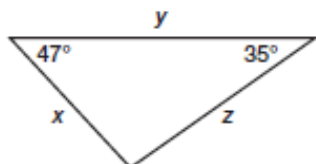
Triangle Inequality Theorem

Triangle Inequality Theorem: The sum of the lengths of any two sides of a triangle is greater than the length of the third side.
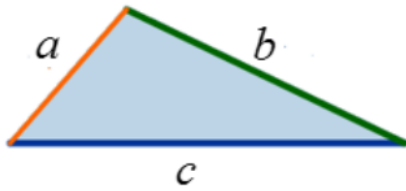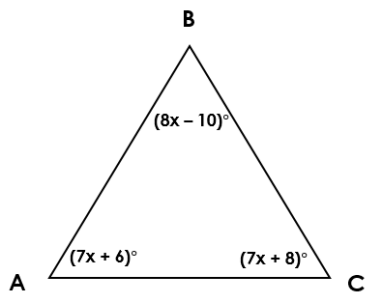
$$a + b > c$$
$$a + c > b$$
$$b + c > a$$

Example: Determine if it is possible to draw a triangle with side measures 12, 11, and 17.

Practice:

For the triangle, list the sides in order from shortest to longest measure.

a.

B

$(8x - 10)°$

$(7x + 6)°$ $(7x + 8)°$

A   C

b. In ΔSTU

m∠S = 50°
m∠T = 70°
m∠U = 60°

For the triangle, list the angles in order from smallest to largest measure.

a. In ΔTUV
    UV = 17
    TV = 14
    TU = 9

b.

K

18 cm   13 cm

L   M
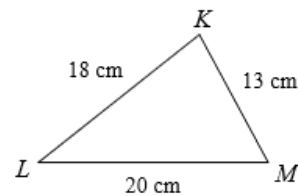   20 cm

Determine if it is possible to draw a triangle with the following side measures:

a. 7, 11, 18   b. 9, 14, 22