

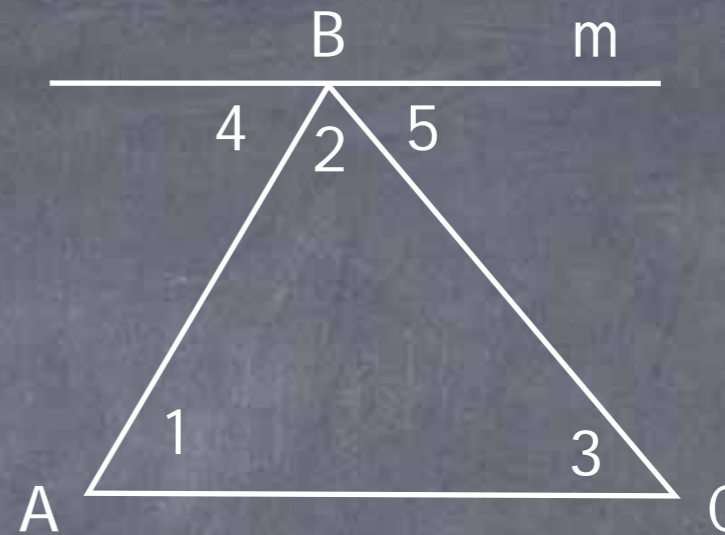
Triangles

Chapter 4

What is the sum of the angles inside a triangle?

180° ?

Prove it



$$\overline{AC} \parallel m$$
$$m\angle 4 + m\angle 2 + m\angle 5 = 180^\circ$$
$$\angle 1 \cong \angle 4 \quad \text{and} \quad \angle 3 \cong \angle 5$$
$$m\angle 1 = m\angle 4 \quad \text{and} \quad m\angle 3 = m\angle 5$$
$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

Given

Angle Addition Postulate/Definition of a Straight Angle

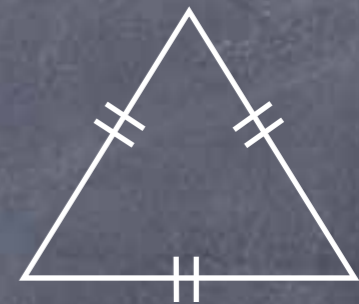
Alternate Interior Angles Theorem

Definition of Angle Congruence

Substitution

Classifying Triangles by Sides

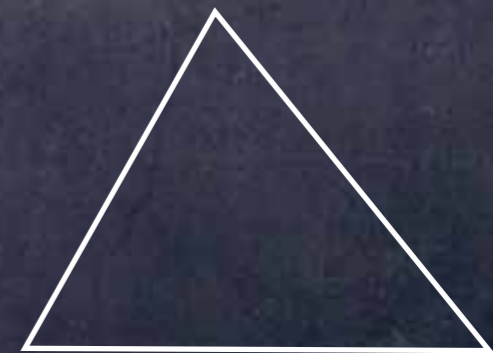
• Equilateral - Three congruent sides



• Isosceles - Two congruent sides



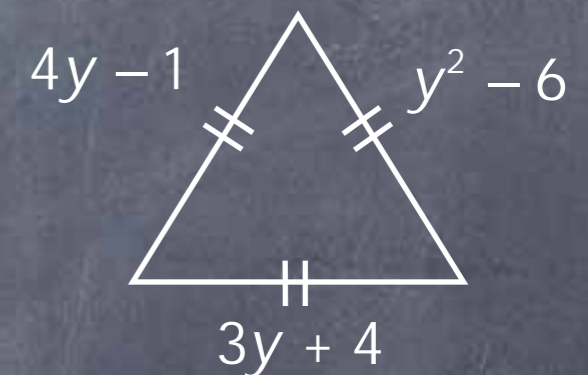
• Scalene - No congruent sides



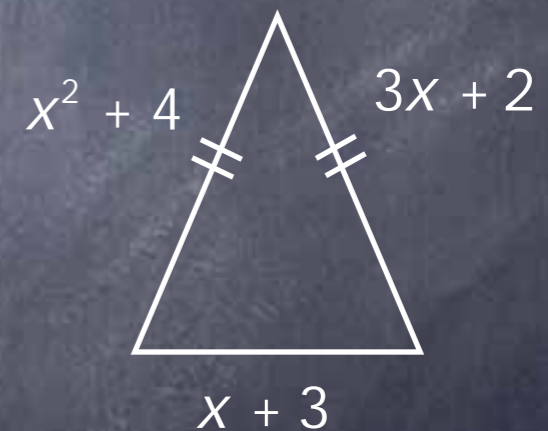
Classifying Triangles by Sides

Find the values of x , y , and the measures of the sides of each triangle

• Equilateral - Three congruent sides



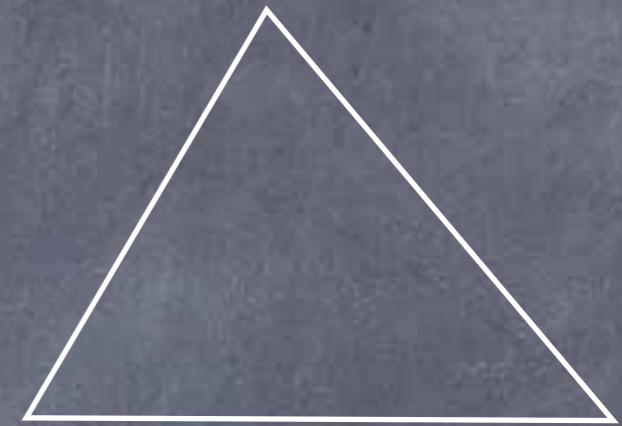
• Isosceles - Two congruent sides



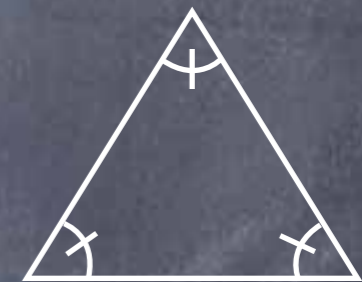
Be ready to discuss these answers in class

Classifying Triangles by Angles

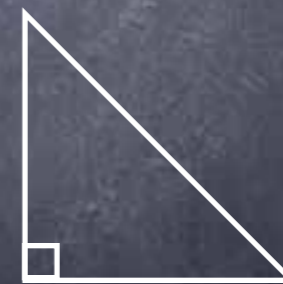
- Acute - All three angles $< 90^\circ$



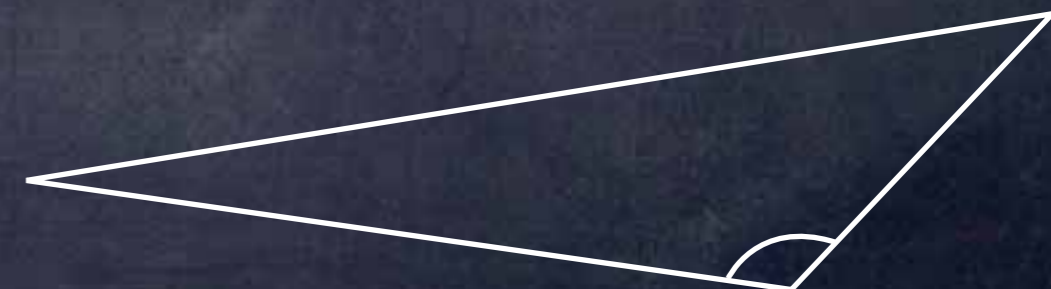
- Equiangular - All three angles = 60°



- Right - One right angle



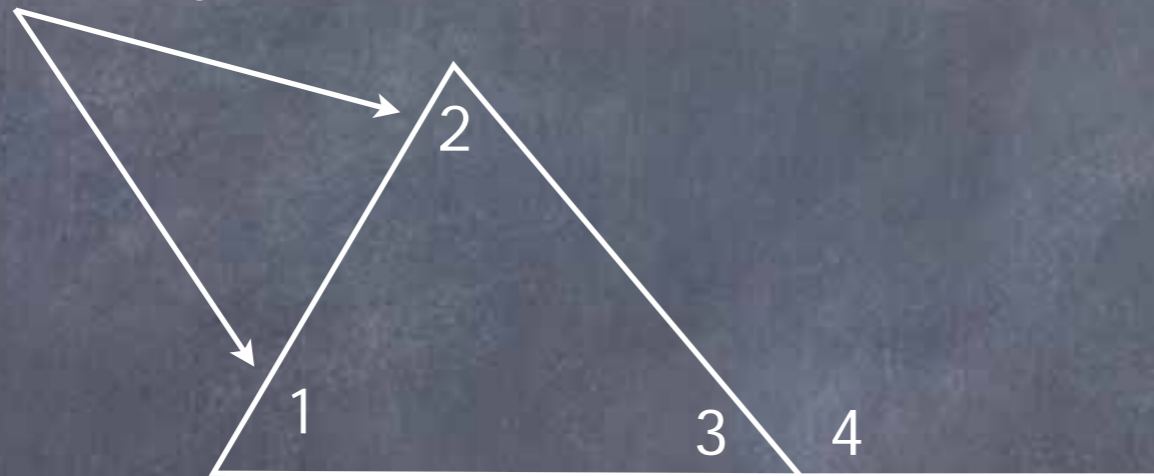
- Obtuse - One obtuse angle



Exterior Angle Theorem (you'll be proving this)

The measure of an exterior angle of a triangle is equal to the sum of the measures of its remote interior angles

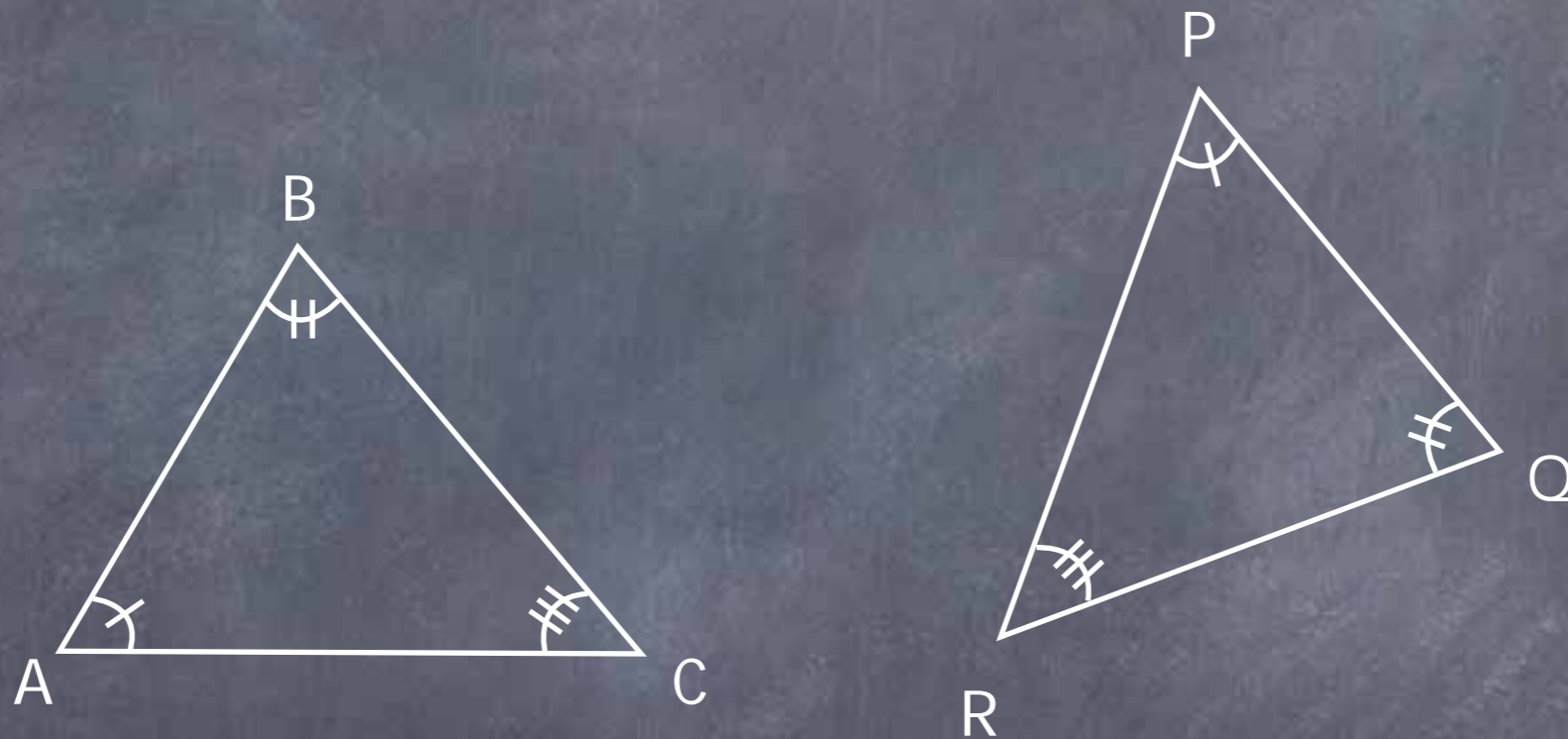
Remote Interior Angles



$$m\angle 4 = m\angle 1 + m\angle 2$$

Third Angle Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the third pair of angles are congruent.



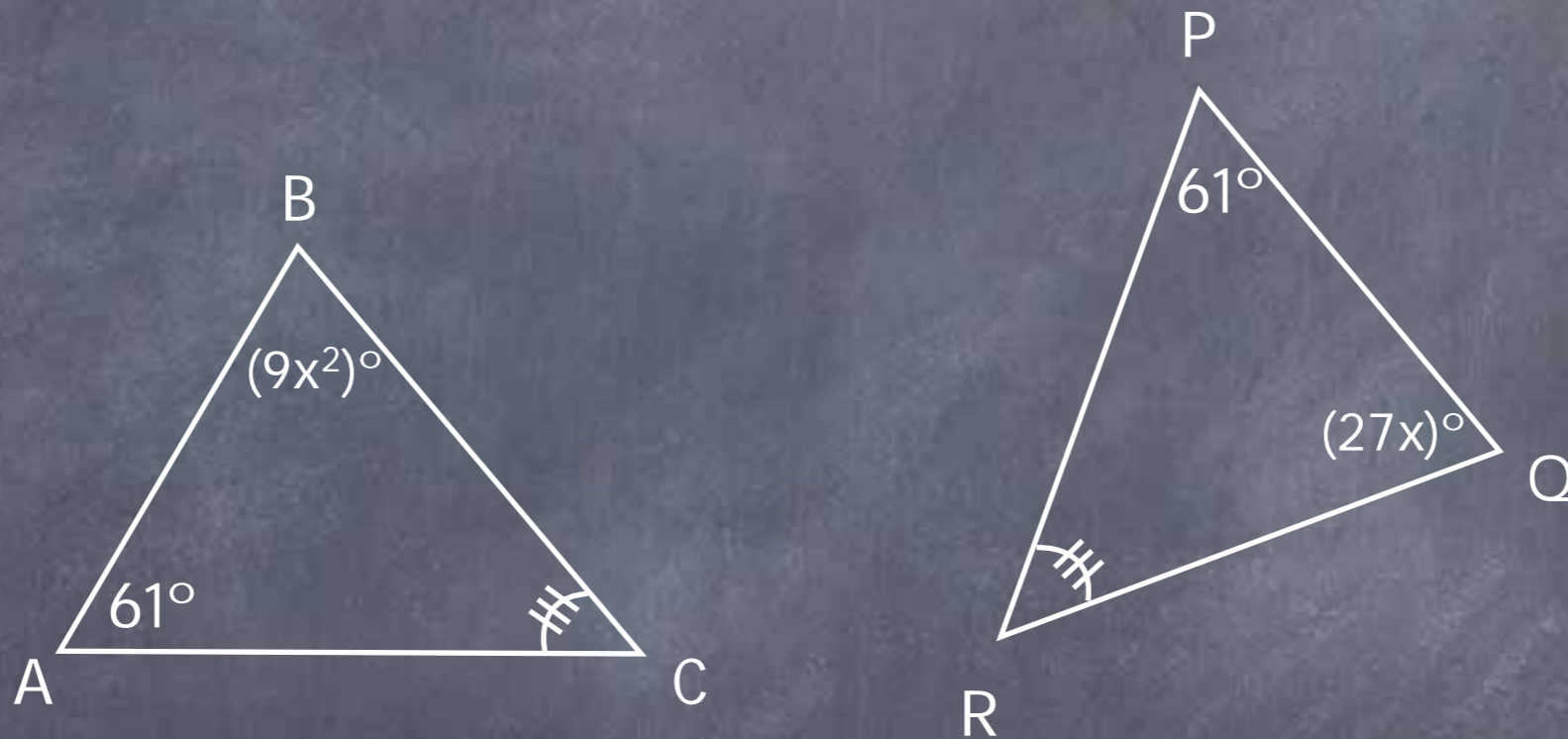
$$\angle A \cong \angle P$$

$$\angle B \cong \angle Q$$

If this is true then $\angle C \cong \angle R$

Third Angle Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the third pair of angles are congruent.



Find the values of x , $m\angle C$, $m\angle R$, $m\angle B$, and $m\angle Q$

Be ready to discuss these answers in class