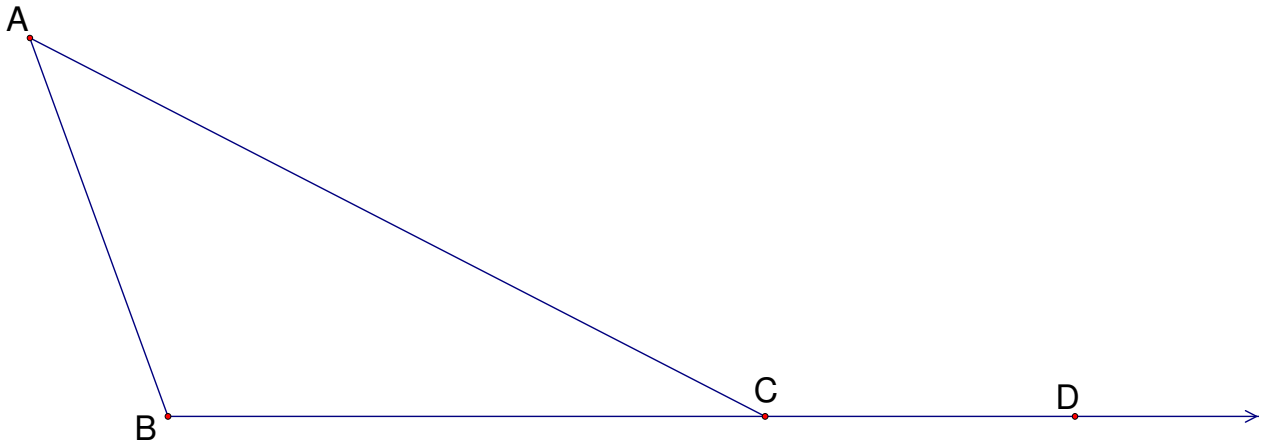
Exploring
Triangles with Parallel Lines
Level A

In this activity we will be exploring triangles and making some conjectures about the angles that are formed inside and outside the triangle

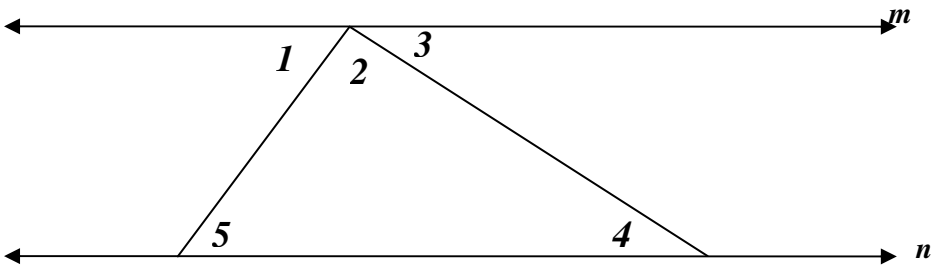
Directions: Complete the following questions with your observations.

1. Measure the three angles in the triangle below and ∠ACD. Write the measurements in the angles.



2. What is the sum of the angles inside the triangle?_____

3. Proving the Triangle-Angle-Sum Theorem:
   In the drawing below, $m \| n$. Answer the following questions to prove what you found in #2



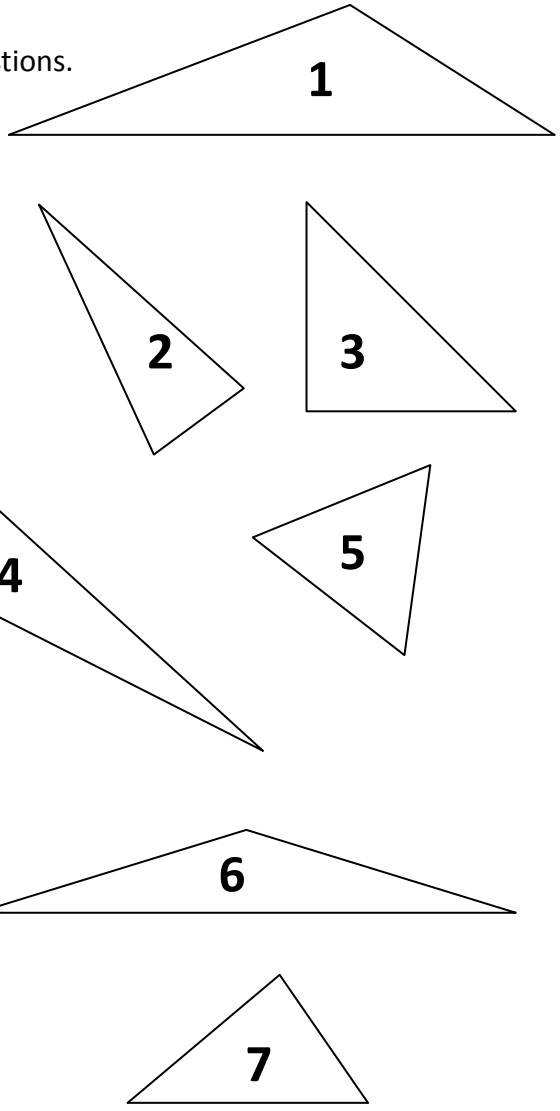
   a. What is the sum of $m\angle 1 + m\angle 2 + m\angle 3$? _____

   b. What do you know about ∠1 and ∠5? Why?

   c. What do you know about ∠3 and ∠4? Why?

4. What can you conclude about $m\angle 5 + m\angle 2 + m\angle 4$? Explain?

5. **Types of Triangles.** Use the Triangles below to answer these questions.



   a. **Equiangular** triangles have 3 congruent angles.
   Which of the triangles are *equiangular?*

   b. **Acute** triangles have 3 acute angles.
   Which of the triangles are *acute*?

   c. **Right** triangles have 1 right angle.
   Which of the triangles are *right* triangles?

   d. **Obtuse** triangles have 1 obtuse angle.
   Which of the triangles are *obtuse* triangles?

   e. **Equilateral** triangles have 3 congruent sides.
   Which of the triangles are *equilateral* triangles?

   f. **Isosceles** triangles have 2 congruent sides.
   Which of the triangles are *isosceles* triangles?

   g. **Scalene** triangles have *no* congruent sides.
   Which of the triangles are *scalene* triangles?

6. ∠ACD (in the triangle in #1) is called an **exterior angle** .

   What is m∠*ACD* = _____

   ∠A and ∠B are called **remote interior angles** because they are inside the triangle and not adjacent to ∠ACD.

   What is $m\angle B + m\angle A$ = _____

   Conjecture: Make a conjecture about exterior angles and the sum of their remote interior angles: