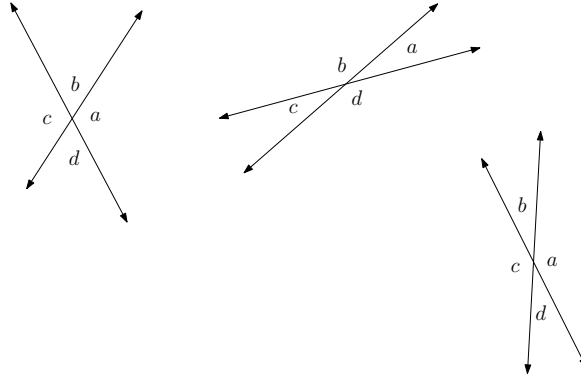**Definitions**

Postulate:

Theorem:

Parallel Postulate:

Angles Formed by Two Lines

1. In the figure below, there are three pairs of lines meeting at a point. (Or you may think of the figure as showing three possible configurations of a single pair of lines meeting at a point.) How do angles a and c appear to be related? What about b and d?

2. Will your observation from part 1 hold for *any* pair of lines meeting at a point? Can you explain?

3. Explain why your observation from part 1 is always true using the fact that the angle formed by a straight line is 180°.

Why the Angles in a Triangle Add to 180°

In this activity, we'll have one person walk around a triangle. By keeping track of how much the "walker" turns (facilitated by a "turner" whose sole job is to track the turning), we'll see that the angles of a triangle add to 180°. Use the diagram below to represent the path traveled by the "walker."
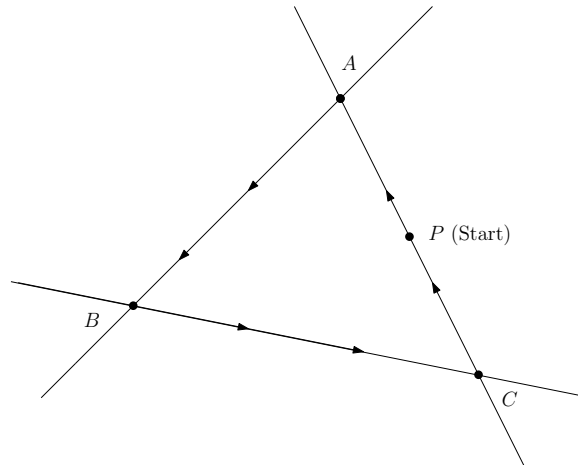
4. If the walker and turner were facing north at the beginning, which directions did the turner face during the experiment? Were any directions left out? Were any directions repeated?

5. What is the full angle of rotation of the turner when the walker walked once all the way around the triangle, returning to the starting point, P?

6. On the diagram, show which angles the walker turned through at the corners of the triangle. Label these angles d, e, f.

7. Based on your answer about how far the turner turned, what is $d + e + f$?

8. If the angles of the triangle are a, b and c, what can you say about $a + b + c$? Justify.

9. What if you had used a different triangle in this activity? Would the answer be the same?

How Mirrors Work:

Normal line:

How Shadows Work: