Exploring Exterior Angles

We have discovered that the sum of the interior angles of an is given by the expression . Now we will investigate the sum of all exterior angles in an .

# Part 1: Explore

1. Measure all the exterior angles ( in the triangle below.
2. Compute the sum
3. Measure all the exterior angles on the quadrilateral below.
4. Find the sum:
5. Use your answers from question 2 and 4 to make a conjecture about the sum of   
   one set of exterior angles on a polygon:

# Part 2: Prove It!

Observations are good, but we need proof!   
So, let’s prove this for a triangle.  
  
Complete the proof below to   
show that

|  |  |
| --- | --- |
| **Statement** | **Reason** |
|  |  |

**In General…**

1. What is the sum of each interior angle and it’s adjacent exterior angle in an ?
2. How many of these pairs are there in an ?
3. Write an *expression* for the sum of *all* the interior angles and one set of exterior angles in an :
4. Write an *expression* for the sum of *all*  the interior angles of an :
5. Now subtract the expression in #4 from #3 to find the sum of one set of exterior angles in an .

**Polygon exterior angle theorem:**   
 The sum of the measures of one set of exterior angles in an is \_\_\_\_\_\_\_\_\_\_