

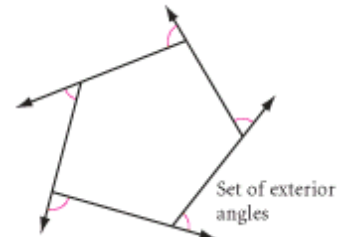
Lesson 5.2: Exterior Angles of a Polygon

In this lesson you will:

- find the sum of the measures of one set of exterior angles of a polygon
- derive two formulas for the measure of each angle of an equiangular polygon

In Lesson 5.1, you discovered a formula for the sum of the measures of the *interior* angles of any polygon. In this lesson, you will find a formula for the sum of the measures of a set of *exterior* angles.

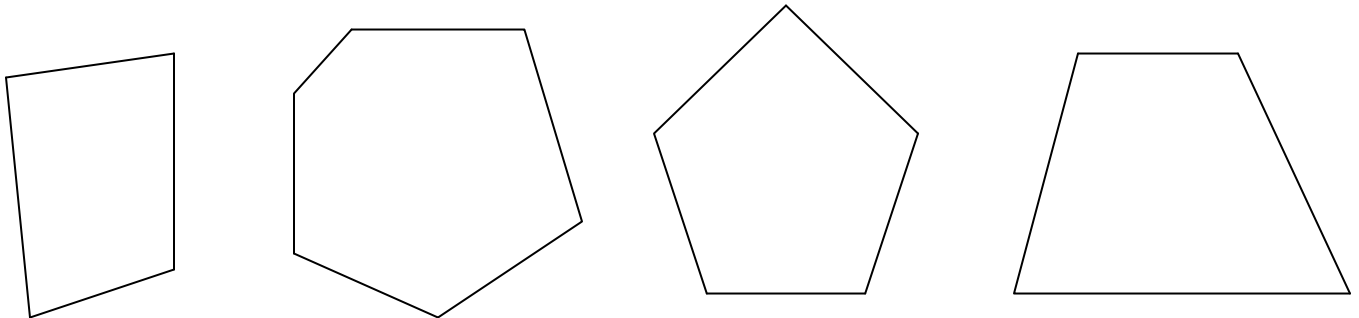
To create a set of exterior angles of a polygon, extend each side of the polygon to form one exterior angle at each vertex.



Investigation 5.2: “Is There an Exterior Angle Sum?”

Let’s use some inductive and deductive reasoning to find the exterior angle measures in a polygon.

- A.) Each person in your group should choose a different polygon from the 4 below. Extend your polygon’s sides to form a set of exterior angles.

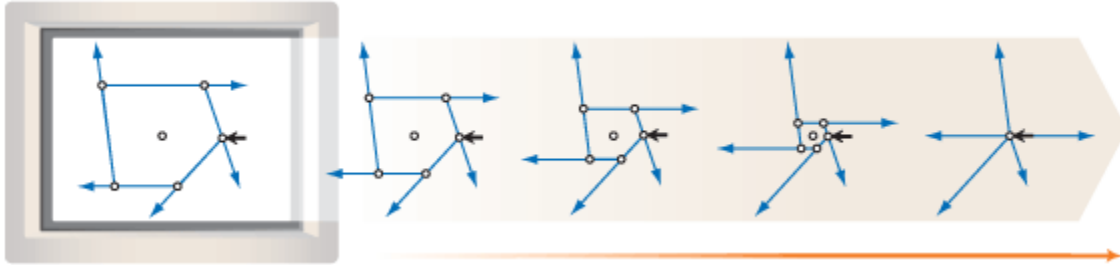


- B.) Measure all the exterior angles of the polygon, and then find the sum of the exterior angles.
- C.) Repeat parts A-B with one of the other polygons. (If you already chose one of the quadrilaterals, choose the pentagon or hexagon!)
- D.) Share your results with the group. What did you discover about the sum of the exterior angle measures?

E.) Based on your observations, complete the conjecture below and add it to your conjecture list.

Exterior Angle Sum Conjecture (C-32)

For any polygon, the sum of the measures of a set of exterior angles is _____.



F.) Study the software construction above. Explain how it demonstrates the Exterior Angle Sum Conjecture.

G.) Using the Polygon Sum Conjecture, write a formula for the measure of each interior angle in an equiangular polygon.

H.) Using the Exterior Angle Sum Conjecture, write the formula for the measure of each exterior angle in an equiangular polygon.

I.) Using your results from part H, you can write the formula for an interior angle of an equiangular polygon a different way. How do you find the measure of an interior angle if you know the measure of its exterior angle?

J.) Complete the next conjecture, and add it to your conjecture list.

Equiangular Polygon Conjecture (C-33)

You can find the measure of each interior angle of an equiangular n -gon by using either of these formulas: _____ or _____.

⇒ASSIGNMENT: _____