6.1

Angles in Polygons

Exploring...

Open on the Sketchpad website the "6.1 – Polygon Interior Angles" sketch.

1) **Before exploring the sketch, what is the sum of the interior angles in any triangle?** _____

2) **Complete the table according to the sketch:**
   (To show the number of triangles in each polygon, tap on "Show Clue.")

Name	Sum of Angles	# of Sides	# of Triangles in a Polygon	Product of # of triangles X 180º
Quadrilateral		_____		
Pentagon				
Octagon				

3) **What's the relationship between the number of sides of a polygon and the number of triangles within a polygon?**

Exploring...

4) What's the relationship between the interior angle sum of each polygon AND the product of the number of triangles and 180 degrees?

5) Try to figure out a formula to determine the sum of the interior angles of a polygon.

6) Complete the following:

| Name	# of Sides	Sum of Angles
Hexagon		
Decagon		
16-gon		

Triangle Sum Theorem

POK

The ____ of all the _____ in a triangle is ____ _____.

POK

Triangle Exterior Angle Theorem

The measure of an exterior angle of a triangle is _____ to the _____ of the _____ _____ _____ .

How do we figure out the sum of the angles in any polygon?
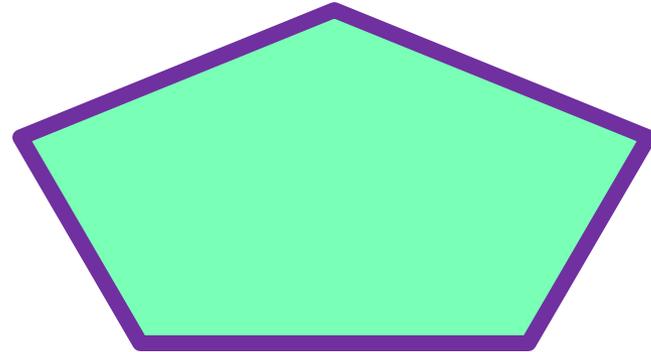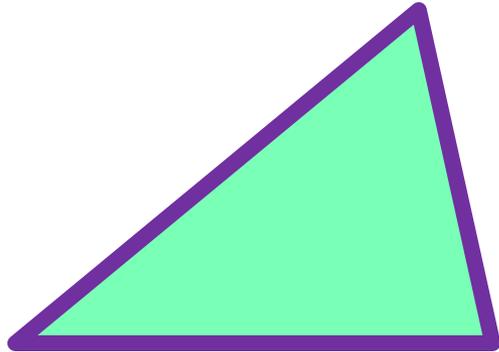
Polygon Sum Formula

POK

The _____ of all the _____ in any _____ is _____.
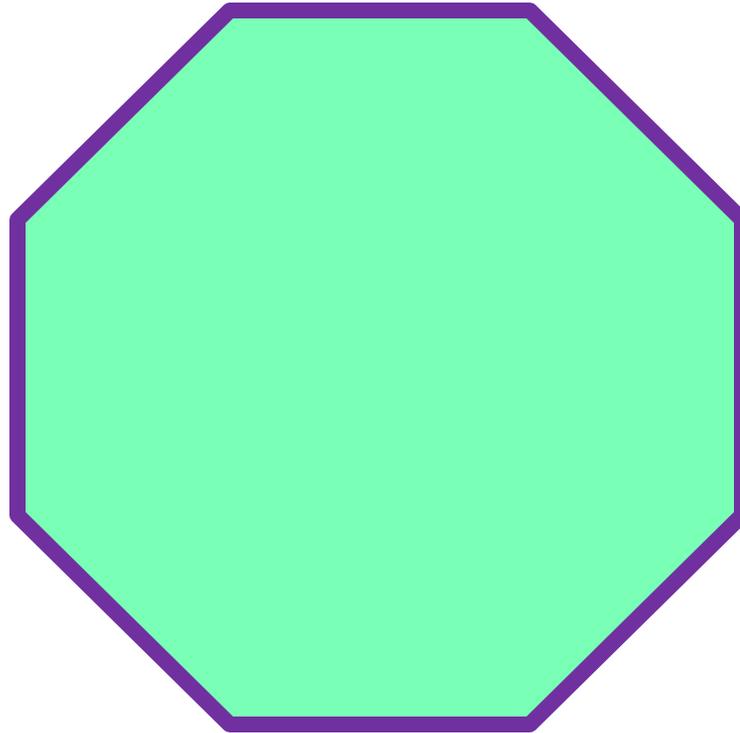
Equilateral Polygon

A polygon with all _____ _____ .

Equiangular Polygon

A polygon with all _____ _____ .

Regular Polygon

A polygon with all _____ and _____ _____ .

# How do we figure out how many degrees one angle is in an equiangular polygon?
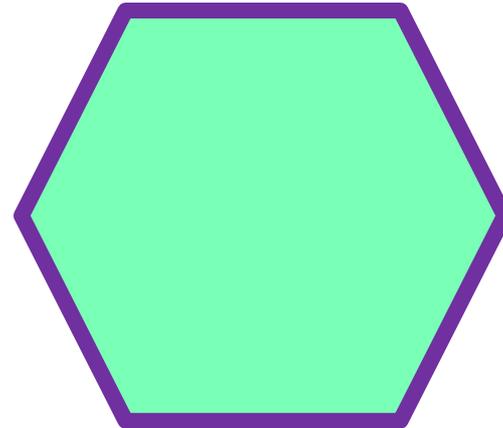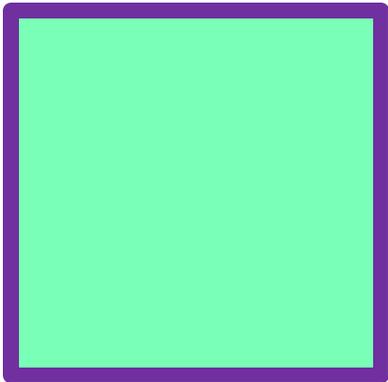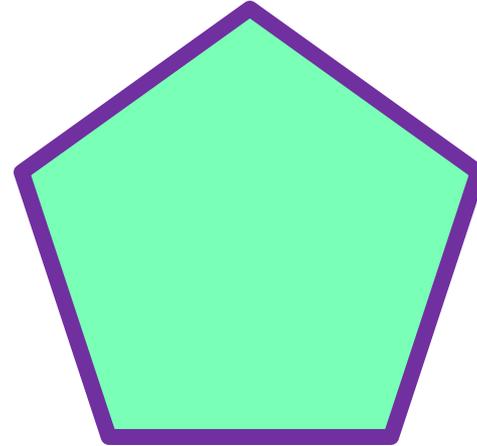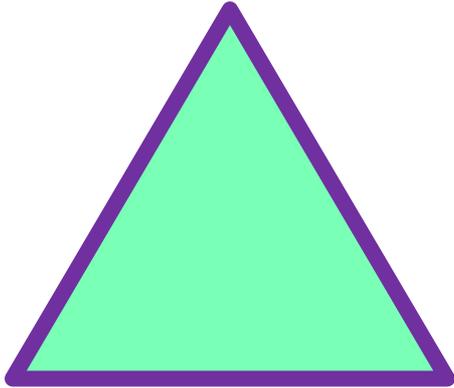
POK

The measure of one angle in any _____ polygon can be found using the formula:
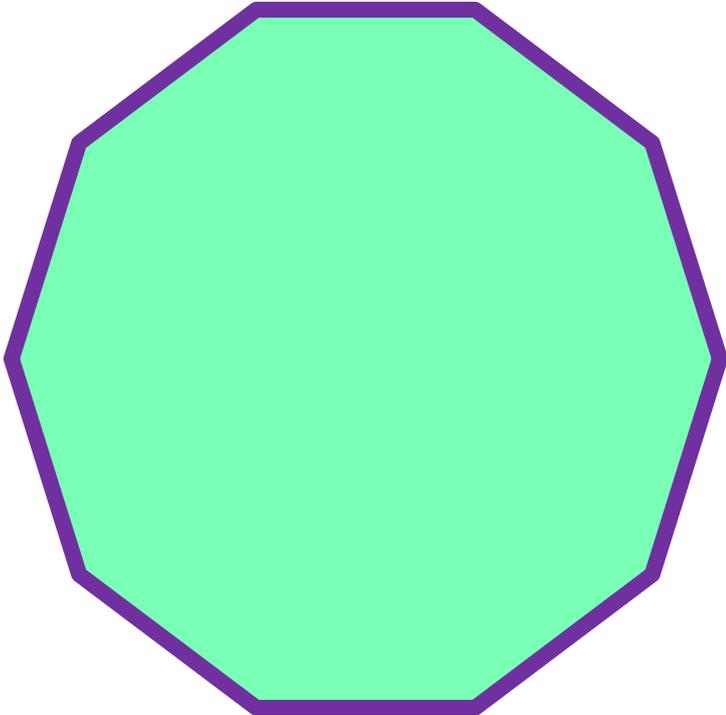
Making exterior angles in a polygon
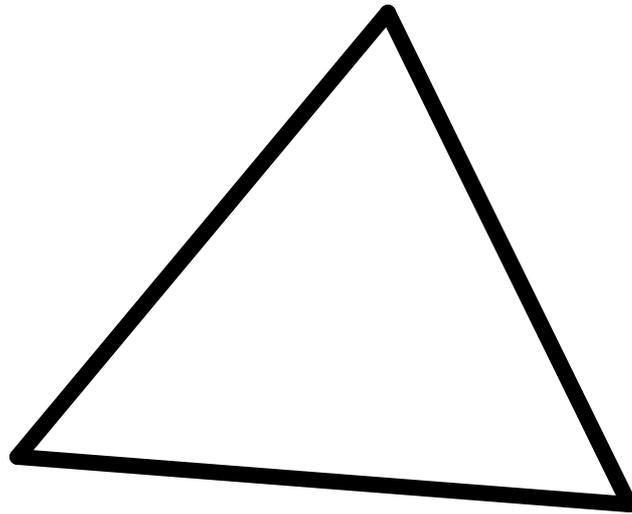
Making exterior angles in a polygon
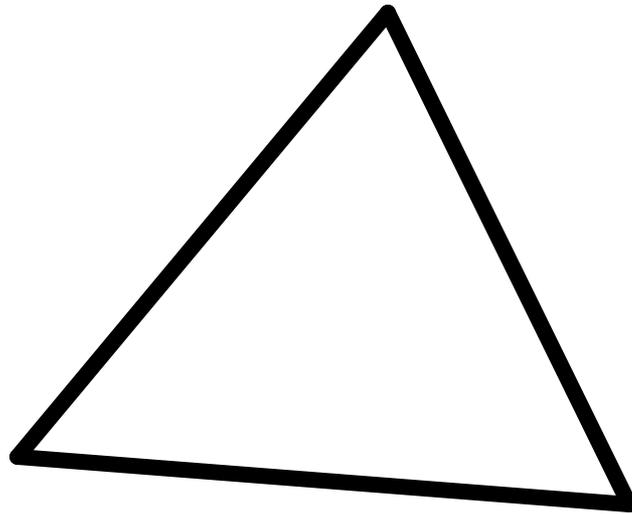
# Making exterior angles in a polygon
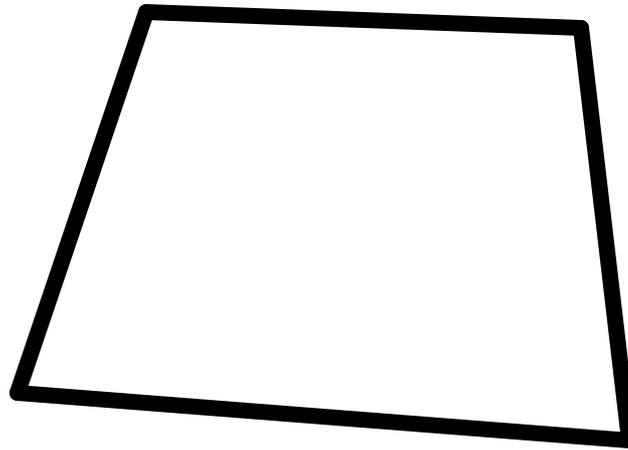
Making exterior angles in a polygon
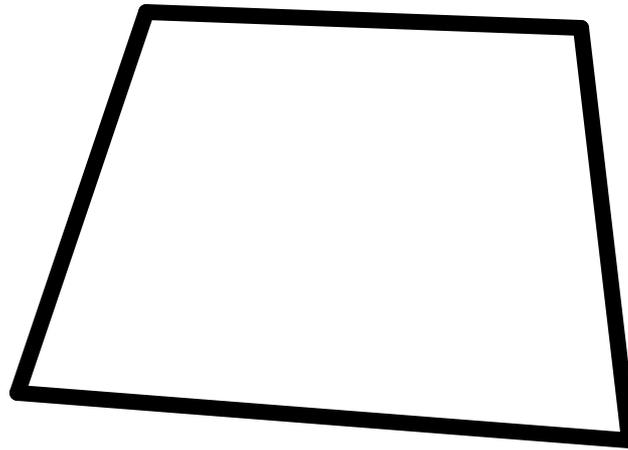
Exploring...

**Open on the Sketchpad website the "6.1 – Polygon Exterior Angles" sketch.**

Name	# of Sides	Sum of Exterior Angles
Triangle		
Quadrilateral		
Pentagon		
Hexagon		

**What would you conjecture is the relationship between all the exterior angles in a polygon?**

_____

_____

**Find the sum of all the interior angles.**

1)
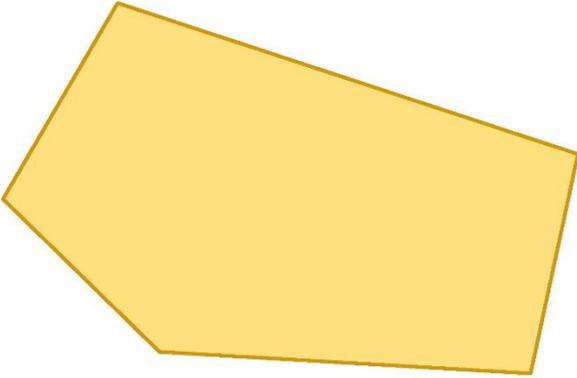
Find the sum of all the interior angles.

2)
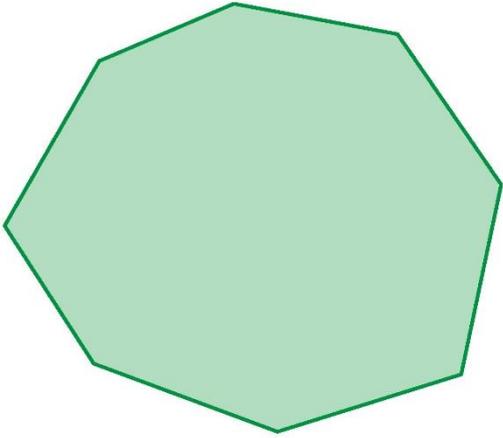
**In the following regular polygon, what is the measure of one angle.**

3)
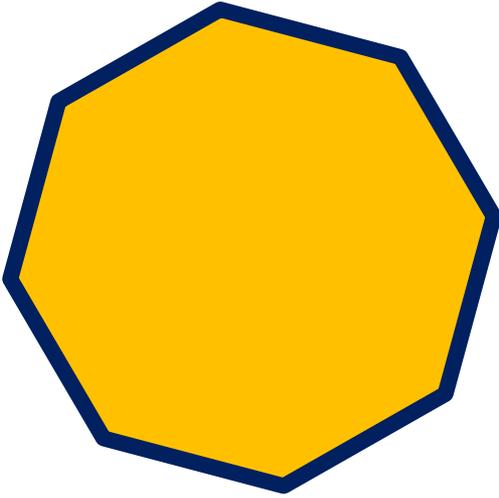
Find all the angles.

4)

$x°$

$115°$

$80°$

Find all the angles.

5)
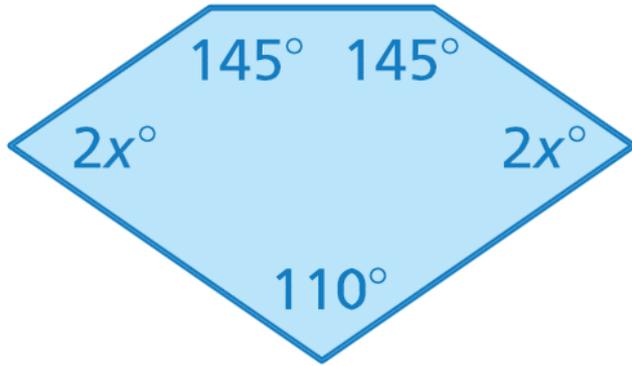
Find all the exterior angles.

6)

127°

50°

$x°$

91°
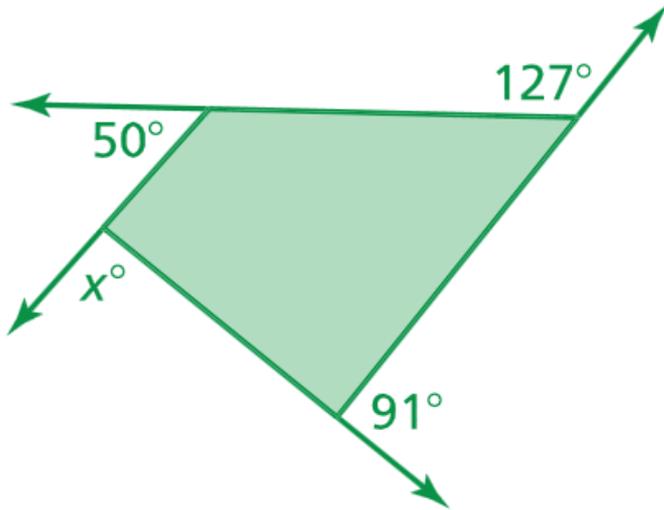
Find all the exterior angles.

7)

124°

z°

(z + 26)°
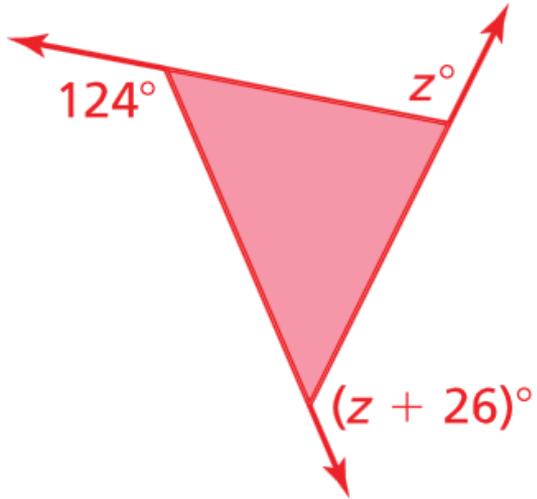
8) **A stop sign is in the shape of a regular octagon. What is the measure of each interior angle?**