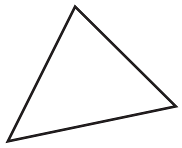
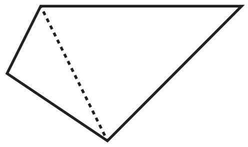
Practice Run

1. Use the triangle interior angles sum to complete the following table.

Polygon	Number of Sides	Number of triangles	Sketch	Interior Angles Sum
triangle	3	1		180°
quadrilateral	4	2		$2 \times 180^\circ = 360^\circ$
pentagon				
hexagon				
heptagon				
decagon				

2. Look for a pattern in your table. Use this pattern to determine the interior angles sum for

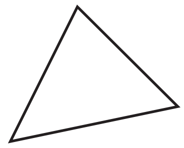
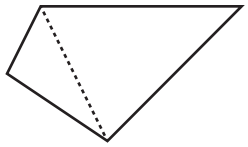
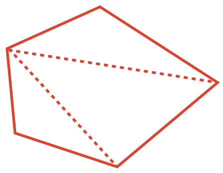
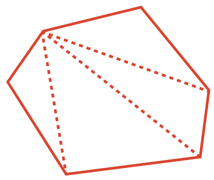
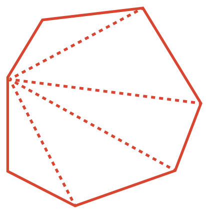
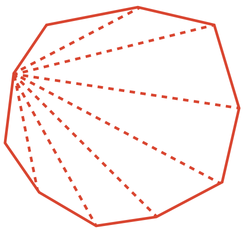
   a. a hectagon (a 100-sided polygon)

   b. a myriagon (a 10 000-sided polygon)

3. Determine an expression that will allow you to find the interior angles sum of an *n*-sided polygon.

Compare your answers.

1. Use the triangle interior angles sum to complete the following table.

Polygon	Number of Sides	Number of triangles	Sketch	Interior Angles Sum
triangle	3	1		180°
quadrilateral	4	2		$2 \times 180^\circ = 360^\circ$
pentagon	5	3		$3 \times 180^\circ = 540^\circ$
hexagon	6	4		$4 \times 180^\circ = 720^\circ$
heptagon	7	5		$5 \times 180^\circ = 900^\circ$
decagon	10	8		$8 \times 180^\circ = 1440^\circ$

2. Look for a pattern in your table. Use this pattern to determine the interior angles sum for

   a. a hectagon (a 100-sided polygon)

   If you draw all the possible diagonals from one vertex of a convex polygon, you will get two less triangles than the number of sides.

   According to the pattern, a 100-sided polygon could be split into 98 triangles. This means the angle sum will be $98 \times 180^\circ = 17\ 640^\circ$.

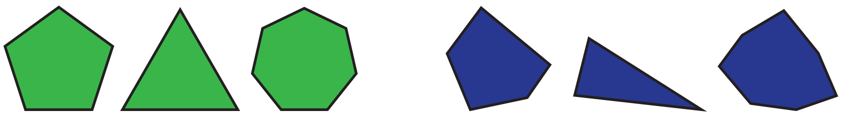
   b. a myriagon (a 10 000-sided polygon)

   According to the pattern, a 10 000-sided polygon could be split into 9998 triangles. This means the angle sum will be $9998 \times 180^\circ = 1\ 799\ 640^\circ$.

3. Determine an expression that will allow you to find the interior angles sum of an *n*-sided polygon.

   If you draw all the possible diagonals from one vertex of an *n*-sided convex polygon, you will have $n - 2$ triangles. Each triangle has a sum of 180°, so the sum of the interior angles of an *n*-sided polygon is $(n-2)180^\circ$.

In the *Practice Run* you learned that the interior angles sum of a convex polygon with *n* sides can be found using the expression $(n-2)180^\circ$. You can also use this expression to determine the individual interior angle measures in a **regular polygon**, a polygon with equal side lengths and angle measures.



regular polygons irregular polygons

The angles in a regular polygon are all equal, so dividing the interior angles sum by the number of angles in the polygon will give the measure of each angle. The measure of an individual interior angle in an *n*-sided polygon can be represented by $\frac{(n-2)180^\circ}{n}$.