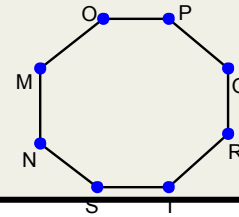
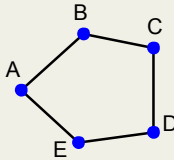
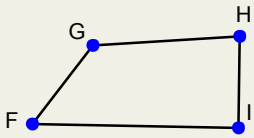


## 6.1 Angles of Polygons

**G.QP.3** Find the measures of interior and exterior angles of polygons. Explain and justify the method used.

**Diagonal** → a segment that \_\_\_\_\_ any two \_\_\_\_\_.

Diagonals form \_\_\_\_\_ when they are connected to nonconsecutive vertices.



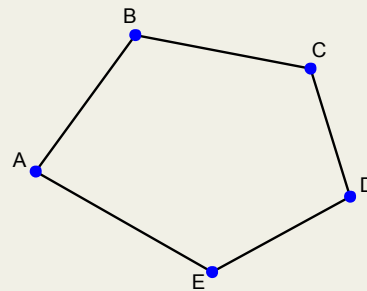
Convex Polygon	Number of Sides	Number of Triangles	Sum of Angle Measures
Triangle	3	1	$(1 \cdot 180)$ or 180
Quadrilateral	4	2	$(2 \cdot 180)$ or 360
Pentagon	5	3	$(3 \cdot 180)$ or 540
Hexagon	6	4	$(4 \cdot 180)$ or 720
Heptagon	7	5	$(5 \cdot 180)$ or 900
Octagon	8	6	$(6 \cdot 180)$ or 1080

### Polygon Interior Angles Sum Theorem

The sum of the \_\_\_\_\_ angles of an  $n$ -sided \_\_\_\_\_ polygon is as follows:

$$S =$$

$$\begin{aligned} m\angle A + m\angle B + m\angle C + m\angle D + m\angle E &= 180(5 - 2) \\ &= 180(3) \\ &= 540^\circ \end{aligned}$$



**Ex 1:**

The Pentagon in Washington, D.C., is shaped like a regular pentagon. Find the sum of the measures of the interior angles of the largest pentagon-shaped section of the Pentagon building.

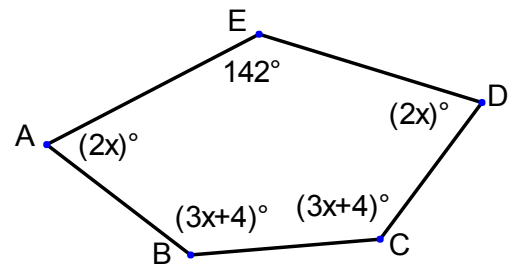


**Ex 2:**

The measure of an interior angle of a regular polygon is 135. Find the number of sides of the polygon.

**Ex 3:**

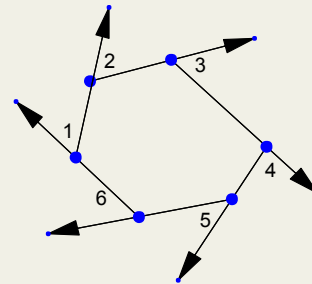
Find the measure of each interior angle of polygon  $ABCDE$ .



### Polygon Exterior Angles Sum Theorem

The sum of the \_\_\_\_\_ angle measures of a \_\_\_\_\_ polygon, one angle at each vertex, is  $360^\circ$ .

$$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 + m\angle 6 =$$



**Ex 4:**

Find the measures of an exterior angle and an interior angle of convex regular nonagon  $ABCDEFGHI$ .

**Ex 5:**

Find the value of  $x$  in the diagram.

