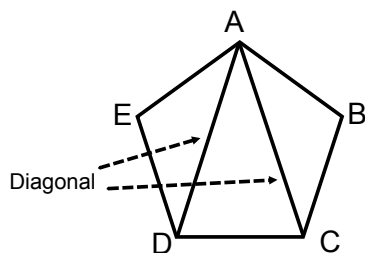


6-1

Angles of Polygons

Polygon Interior Angle Sum (any polygon)

A "Diagonal" can be drawn from any corner of a polygon to any other corner (not next to). The max number of diagonals that can be drawn is always 3 less than the number of corners. The max number of triangles created is always 2 less than the number of corners.

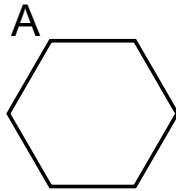


Things to notice...

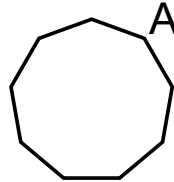
- 5 corners (vertices)
- 2 Diagonals Drawn
- 3 Triangles Created

In each figure below, draw as many diagonals as possible from corner A. Then state the following:

- Number of Corners
- Number of Diagonals
- Number of Triangles



Corners =
Diagonals =
Triangles =



Corners =
Diagonals =
Triangles =

Polygon Interior Angle Sum (any polygon) Formula

The sum of all the interior angles inside of a polygon will always be:

$$\text{Sum} = (180 \text{ degrees})(\text{Total \# of Triangles})$$

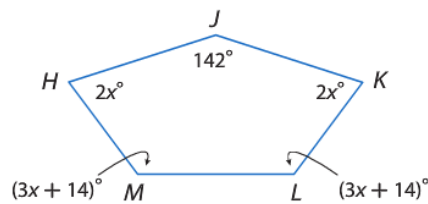
or

$$S = 180(n - 2) \text{ where "n" is the number of sides}$$

Given the number of sides for a polygon,
what would be the Sum of the Interior
Angles?

- 1) 5 sides
- 2) 9 sides
- 3) 20 sides

Solve for x and find the measure of each individual angle (Hint....what should the SUM of the Interior angles be for a 5 sided polygon?)



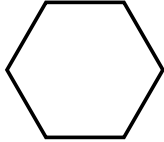
REGULAR POLYGONS

These polygons have congruent angles AND congruent sides.

(If we know the sum of all the angles, then we can find the measure of an individual angle by dividing by the total number of angles)

Regular Hexagon

(6 sides / 6 angles)



$$\begin{aligned}
 \text{Sum of Interior Angles} &= 180(n - 2) \\
 &= 180(6 - 2) \\
 &= 180(4) \\
 &= 720
 \end{aligned}$$

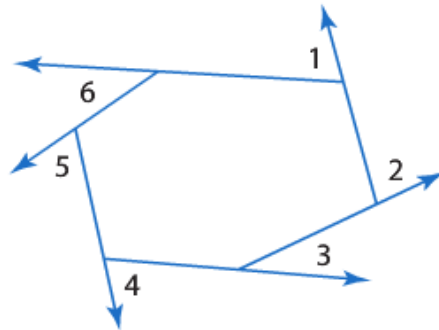
$$\begin{aligned}
 \text{Single Interior Angle of a REGULAR POLYGON} &= (\text{Sum}) / (\text{Total Angles}) \\
 &= (720) / 6 \\
 &= 120
 \end{aligned}$$

Find the measure of each INTERIOR angle of a REGULAR polygon with the given number of sides below:

- 1) 5 sides
- 2) 9 sides
- 3) 20 sides

Polygon Exterior Angle Sum (any polygon)

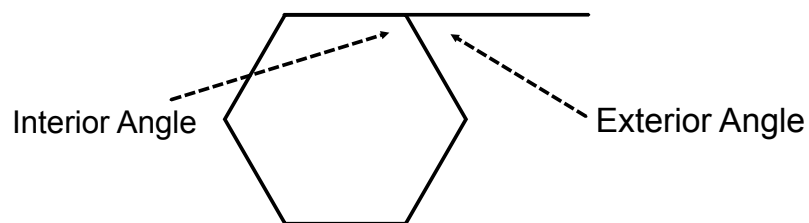
The sum of all exterior angles of a ANY polygon will always total 180 degrees.



$$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 + m\angle 6 = 360$$

IMPORTANT NOTE:

Exterior Angles and Interior Angles form a Linear Pair (supplementary)



Solve for x and find the measure of each individual EXTERIOR angle
(Hint....what should the SUM of the EXTERIOR angles be for ANY polygon?)

