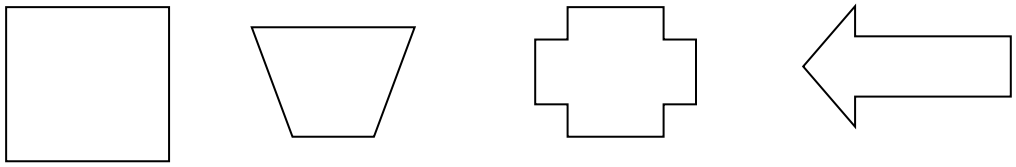
11-5 Polygons

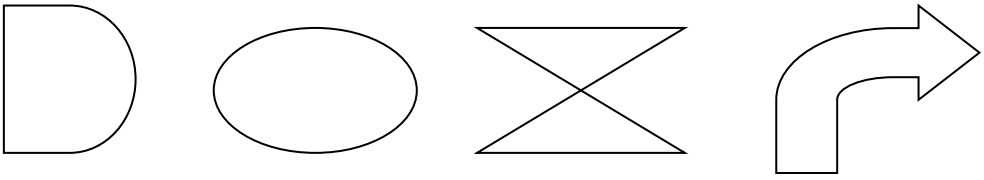
A polygon is:

1) **Closed figure**
2) **At least 3 sides**
3) **All sides are straight**
4) **Segments meet only at a vertex**
5) **Only 2 segments meet at a vertex**

Polygons:



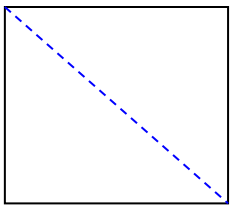
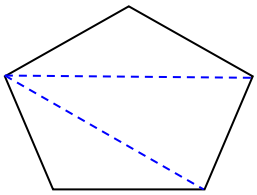
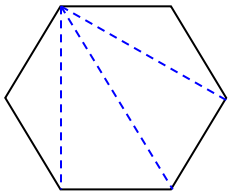
Not Polygons:



POLYGON	NUMBER OF SIDES	POLYGON	NUMBER OF SIDES
Triangle	3	Octagon	8
Quadrilateral	4	Nonagon	9
Pentagon	5	decagon	10
hexagon	6	undecagon	11
Heptagon	7	dodecagon	12

REMEMBER???? **REGULAR polygon means that all sides and all angles are congruent.**

A diagonal is a line segment that joins two nonconsecutive vertices in a polygon.

Notice the number of triangles is two less than the number of sides. You can use this relationship to find the sum of the interior angle measures of a polygon.

An interior angle is an angle formed at a vertex of a polygon.

Interior Angles of a Polygon	
Words	Symbols
The sum of the degree measures of the interior angles of the polygon is the number of sides – 2 times 180	180(n – 2)

Find the sum of the measures of the interior angles of a nonagon.

S of m of IA = 180 (n-2) formula
= 180 (9-2) substitute
= 180 (7) simplify
= 1260° answer with label

SHOW STEPS!! SHOW STEPS!! SHOW STEPS!! SHOW STEPS!!

Find the measure of an interior angle of a regular quadrilateral using the formula.

S of m of IA = 180 (n-2)

= 180 (4-2)

= 180(2)

= 360°

So.... $\frac{360}{4} = 90°$ (total divided by # of angles)

Each angle in a regular quadrilateral is 90°

Polygon	Number of Vertices (n)	Number of triangles	Angle Sum (m)
Triangle	3	1	1(180) = 180
Quadrilateral	4	2	2(180) = 360
Pentagon	5	3	3(180) = 540
Hexagon	6	4	4(180) = 720
Heptagon	7	5	5(180) = 900
...	...	...	...
decagon	10	8	8(180) = 1440
100-gon	100	?	?
n-gon	**n**	**n - 2**	**(n – 2)180**