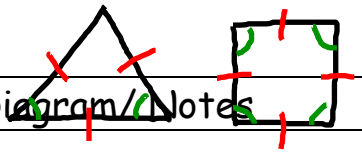
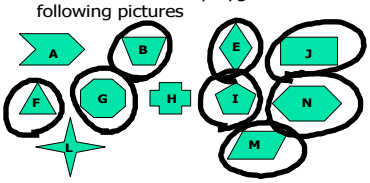
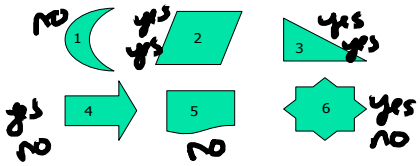
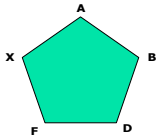
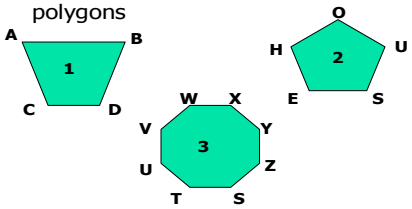
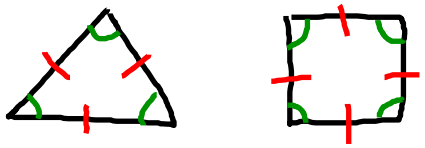
Vocabulary Sheet for Lesson 3-5



Definition	Diagram/Notes
Definition Polygon – "Poly" means many and "gon" means angles; formed by coplanar segments; each segment meets two others at their endpoints	
Definition Convex Polygons – polygon such that no line containing a side of the polygon contains a point in the interior of the polygon **Test:** connect two non-consecutive vertices, if there are any points on the inside of the line then it is not convex	
Pick the Convex Polygons ▪ Choose the convex polygons from the following pictures 	**Example 1** ▪ Decide if the following are polygons. If they are, decide if they are convex. 
Classifying Polygons ▪ Polygons are classified by the number of sides that they have Number of Sides | Name 3 Triangle 4 Quadrilateral 5 Pentagon 6 Hexagon 7 Heptagon 8 Octogon 9 Nonagon 10 Decagon N N-gon	**Naming a polygon** ▪ We name a polygon in order (either clockwise or counter-clockwise) Named pentagon ABDFX 
Example 2 ▪ Classify and name the following polygons 	1) quadrilateral ABDC 2) pentagon HOUSE 3) octagon WXYZSTUV
Definition: Diagonal – a segment going through the polygon connecting two non consecutive vertices	

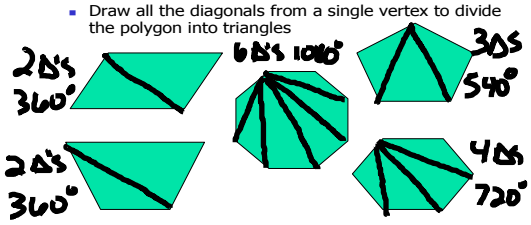
Definition:

Regular polygon – a polygon where all the sides are equal and all the angles have the same measure



Finding the Sum of the Interior Angles of any Polygon

- Draw all the diagonals from a single vertex to divide the polygon into triangles



Angle Sums

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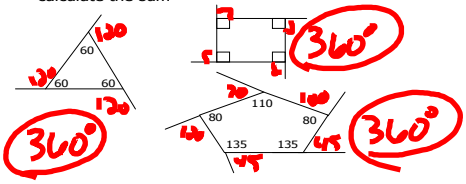
Number of sides	Sum of interior angles
4	360
5	540
6	720
8	1080

Formula for finding the sum (Theorem 3-13):

Sum of interior angles = 180 (n – 2) where n = # of sides

What is the Sum of the Exterior Angles of any Polygon?

- Find the measures of each exterior angle then calculate the sum



Example 3

- If a regular polygon has 12 sides, what is the measure of each exterior angle?

$\frac{360}{12} = 30°$

- Each interior angle?

$180 - 30 = 150°$

Theorem 3-14:

The sum of the measures of the exterior angles of any convex polygon, one angle at each vertex, is 360°

Example 4

- If a regular polygon has an exterior angle measure of 18, how many sides does it have?

$\frac{360}{18} = 20$ sides

- What is the measure of each interior angle?

$180 - 18 = 162°$

Example 5

- If a regular polygon has an interior angle measure of 140, how many sides does it have?

$\frac{360}{40}$ 9 sides

- What is the measure of each exterior angle?

$180 - 140 = 40°$