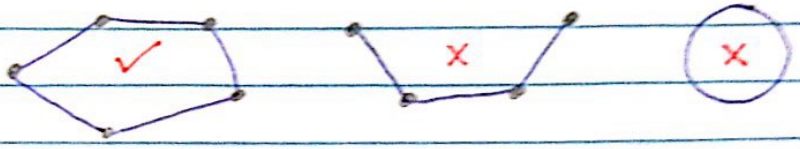
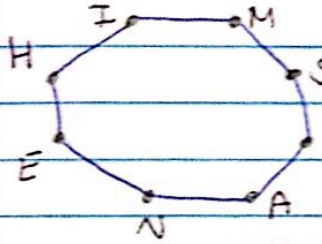
Polygons

① Polygon: Closed figure; has at least 3 sides that intersect only endpoints



② Naming Polygons: Start at one endpoint & include every vertex → clockwise or counterclockwise



HIMSLANE

→ Don't have to put a "figure" in front of name b/c # of letters tells size (if bigger than 3)

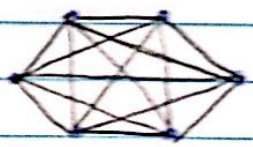
* Doesn't matter where you start as long as you go in order

③ Classifying Polygons:

	Size
3	triangle
4	Quadrilateral
5	pentagon
6	hexagon
7	heptagon / septagon
8	octagon
9	nonagon
10	decagon
12	dodecagon
"n"	n-gon
18	18-gon

Concavity

Convex:



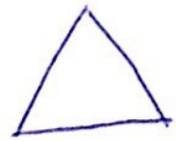
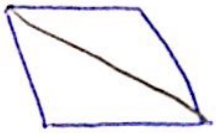
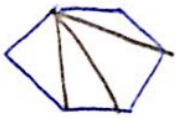
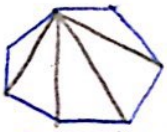
all diagonals drawn INSIDE polygon

Concave:

at least 1 diagonal is OUTSIDE polygon

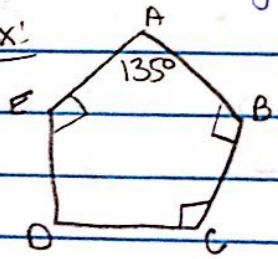
The Sum of Polygon Angles Measures

formed by non overlapping diagonals

Polygon	Number of Sides	Number of Triangles Formed	Sum of the Interior Angle Measures
 Triangle	3	1	180°
 Quadrilateral	4	2	360°
 Pentagon	5	3	540°
 hexagon	6	4	720°
 heptagon / Septagon	7	5	900°
No Figure	n	n-2	(n-2)180

(4) Polygon ∠ Sum: the sum of the interior ∠s of an "n-gon" is (n-2)180

Ex: Find m∠D

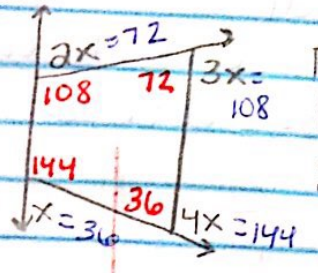


90 + 90 + 90 + 135 + D = 540

m∠D = 135

(5) Polygon exterior ∡ sum: the sum of the exterior ∡s of any polygon is 360

Ex:



Find the value of x and each INTERIOR ∡.

$2x+3x+4x+x=360$

$x=36$

☆ Interior & exterior ∡s are supplementary → form a linear pair

(6) Types of polygons:

- Equilateral – all sides are ≅  (rhombus)
- Equiangular – all ∡s are ≅  (rectangle)
- Regular – all sides & ∡s ≅  (square)

☆ for regular polygons: $n(m\angle ext) = 360$ (n = # of sides; ext ∡)

Ex:

(a) if the measure of one interior ∡ of a regular polygon is 150°, find the # of sides.

int = 150 ext = 30 $n(30)=360$ **n = 12 (dodecagon)**

(b) If the measure of one exterior ∡ of a regular polygon is 72°, find the # of sides

ext = 72 $n(72)=360$ **n = 5 (pentagon)**

(c) if the measure of one interior ∡ of a regular polygon is 135°, find the # of sides, one exterior, sum of interior, & sum of exterior

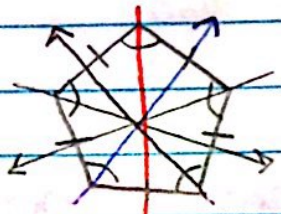
$n(45)=360$ n = 8 ext = 45° $(8-2)180 = 1080°$ 360°

(7) Symmetry:

Line Symmetry - half of the figure is a mirror image of the other half

Rotational Symmetry - a figure is its own image for some rotation of 180° or less

Ex:

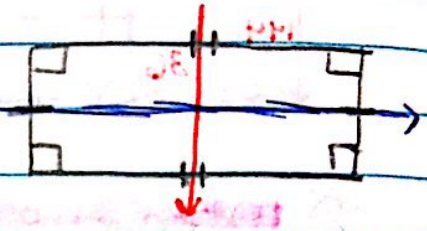


5 Lines of Symmetry

Rotational: $\frac{360}{\#\text{ of turns}}$

$\frac{360}{5}$ = 72° Rotational

Ex:



2 Lines of symmetry

Rotational: $\frac{360}{2}$

= 180° Rotational