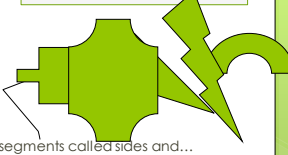
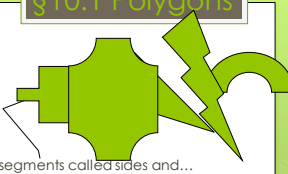


§10.1 Polygons

- Definitions:
 - Polygon
 - A plane figure that...
 - Is formed by 3 or more segments called sides and...
 - ..each side intersects exactly 2 other sides, one at each endpoint.



Polygon

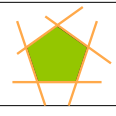


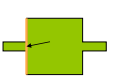
Not a Polygon

§10.1 Polygons

Definitions...

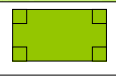
- Convex
 - No line that contains a side of the polygon also contains a point in the interior of the polygon.
- Concave
 - Not convex (also called nonconvex)
 - Has a "cave in"







§10.1 Polygons

- Equilateral
 - All sides are congruent
- Equiangular
 - All angles are congruent
- Regular
 - Both equilateral AND equiangular

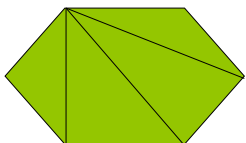






§10.1 Polygons

- Diagonal
 - A segment that joins two *nonconsecutive* vertices.



§10.1 Polygons

Names of Polygons

Name	Number of Sides
Triangle	3
Quadrilateral	4
Pentagon	5
Hexagon	6
Heptagon	7
Octagon	8
Nonagon	9
Decagon	10
Dodecagon	12
n -gon	n

§10.1 Polygons

Interior Angles

- Polygon Interior Angles Theorem
 - The sum of the measures of the interior angles of a convex polygon is $(n - 2)180^\circ$
- Corollary to Polygon Interior Angles Theorem
 - The measure of each interior angle of a regular n -gon is: $\frac{1}{n}(n - 2)180^\circ$ or $\frac{(n-2)180}{n}$

§10.1 Polygons

Exterior Angles

- Polygon Exterior Angles Theorem
 - The sum of the measures of the exterior angles of a convex polygon (one angle at each vertex) is 360° .
- Corollary to Polygon Exterior Angles Theorem
 - The measure of each exterior angle of a regular n -gon is $\frac{1}{n}360^\circ$ or $\frac{360^\circ}{n}$

§10.1 Polygons

Practice

- If each interior angle of a regular n -gon is 108° , how many sides does the polygon have?

$$108 = \frac{1}{n}(n-2) \cdot 180^\circ$$

$$108n = n \left[\frac{1}{n}(n-2) \cdot 180^\circ \right]$$

$$108n = (n-2) \cdot 180^\circ$$

$$\begin{array}{r} 108n = 180n - 360 \\ -108n \quad -108n \\ \hline 0 = 72n - 360 \\ 360 = 72n \\ 5 = n \end{array}$$

$$108 = \frac{(n-2) \cdot 180^\circ}{n}$$

$$108n = n \left[\frac{(n-2) \cdot 180^\circ}{n} \right]$$

$$108n = (n-2) \cdot 180^\circ$$

§10.1 Polygons

Practice

- Find the value of x .

$$\begin{array}{r} 180(n-2) = 40 + 340x \\ 180(6-2) = 40 + 340x \\ 720 = 40 + 340x \\ 680 = 340x \\ 2 = x \end{array}$$
