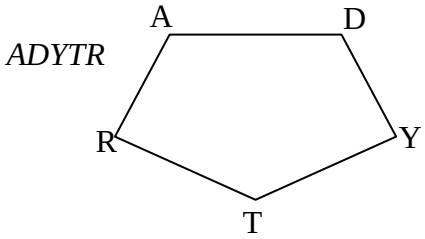
<name>
Class: Honors Geometry
Date: 9/14/06
Topic: Lesson 3-4 (Polygon Angle-Sum Theorems)

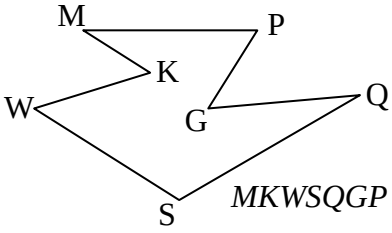
Polygon

A closed figure in a plane
Formed by connected line segments
No gaps
Intersect only at endpoints
Example: square or rectangle but ***not*** a circle

Naming polygons

Just go in order, either direction





Classifying polygons

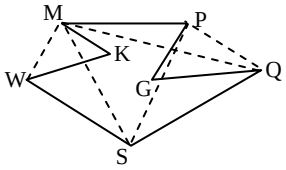
1. By # sides
2. As concave or convex

Diagonal

Segment connecting non-adjacent vertices.

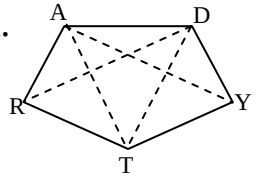
Concave

Part of any diagonal goes outside:



Convex

All diagonals completely inside polygon.
Polygons convex unless told otherwise:



 # sides

General: *n* sides is a *n*-gon.

3 - triangle
4 - quadrilateral
5 - pentagon
6 - hexagon
8 - octagon
9 - nonagon
10 - decagon
12 - dodecagon
n – *n*-gon

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Example	Pg 144, Check Understanding #2 a) hexagon; convex b) octagon; concave c) 24-gon; concave
Theorem 3-9	<u>Polygon Angle-Sum Theorem</u> Sum of measures int $\angle$'s of n-gon is $(n-2)180$
Example	Pg 145, Check Understanding #3 a) 13 sides, $n = 13$, $(n-2)180 = (13-2)180 = 11*180 = 1980$ b) $(n-2)180 = 720$, $n - 2 = 4$, $n = 6$ so 6 sides (hexagon)
Example	Pg 147, problem #18 7 sides, $(7-2)180 = (5*180 = 900$ $y + 125 + 135 + 130 + 129 + 116 + 120 = y + 775$ $y + 775 = 900$, or $y = 145$
Theorem 3-10	<u>Polygon Exterior Angle-Sum Theorem</u> Sum of measures of ext $\angle$'s of poly, 1 @ ea vertex, is 360. $m\angle 1 + m\angle 2 + m\angle 3 + ... + m\angle n = 360$
Special poly classifications	a) <u>Equilateral polygon</u>: all sides congruent. b) <u>Equiangular polygon</u>: all angles congruent. c) <u>Regular polygon</u>: both equilateral and equiangular.
Example	Pg 147, problem #24 1) $\angle$-sum is $(18-2)180 = 16*180 = 2880$ 2) Regular poly so all $\angle$'$s \cong$. 3) Int $\angle$: 18 $\angle$'s so $18x = 2800$ or $x = 160$ 4) Ext $\angle$: 18 ext $\angle$'s so $18x = 360$, or $x = 20$