Name:_____ Period_____ GP

UNIT 10: QUADRILATERALS AND POLYGONS

I can define, identify and illustrate the following terms:

Concave polygon
Convex polygon
Regular Polygon
Diagonal of a polygon
Polygon
Regular
irregular
equilateral
equiangular
triangle
quadrilateral
pentagon
hexagon
septagon (heptagon)
octagon
nonagon
decagon
dodecagon
n-gon
Interior angle
exterior angle

Dates, assignments, and quizzes subject to change without advance notice.

Monday	Tuesday	Block Day	Friday
21 MLK DAY No School	22	23/24	25 **6-1** Polygons
28 **6-1** Polygons & **Review**	29 **TEST**		

Friday, 1/25/13

6-1: Properties and Attributes of Polygons

- ☐ I can name polygons with up to ten sides.
- ☐ I can classify a polygon as concave or convex and regular or irregular.
- ☐ I can find the measure of an interior angle of any regular polygon.
- ☐ I can find the measure of an exterior angle of any regular polygon.

PRACTICE: Polygons – Assignment Worksheet

Monday, 1/28/13

6-1: Properties and Attributes of Polygons

- ☐ I can name polygons with up to ten sides.
- ☐ I can classify a polygon as concave or convex and regular or irregular.
- ☐ I can find the measure of an interior angle of any regular polygon.
- ☐ I can find the measure of an exterior angle of any regular polygon.

PRACTICE: Polygons – Assignment Worksheet

Tuesday, 1/4/11

➔ **Test 10: Quadrilaterals and Polygons**

Polygons – Examples

6.1: Properties and Attributes of Polygons
"I can …
classify polygons based on their sides and angles
find and use the measures of interior and exterior angles of polygons."

I. Definitions

A. **Polygon** – A closed plane figure formed by __ or more line segments. Lines can not _____ (must be straight) and can not cross

B. **Regular Polygon** – A polygon that is both _____ and _____

C. **Concave** – Any part of a diagonal contains points in the exterior of the polygon. Meaning the polygon folds _____ (like a cave)

D. **Convex** – No diagonal contains points in the exterior (folds outward)

NOTE: All regular polygons are CONVEX. A polygon that is not regular is called _____

E. Naming Polygons based on the number of sides.

Number of Sides	Name of Polygon
3	
4	
5	
6	
7	
8	

Number of Sides	Name of Polygon
9	
10	
11	
12	
n	

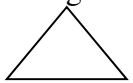
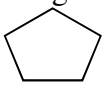
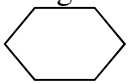
NOTE: Hendecagon is preferred over undecagon since the former uses Greek and Latin.

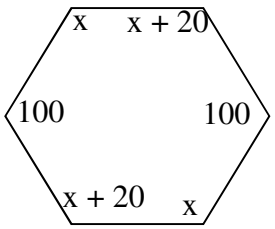
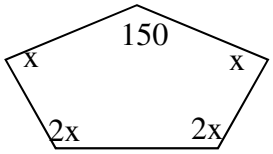
II. Angle Measures

A. Polygon Angle Sum Theorem – The sum of the INTERIOR angle measures of a convex polygon with n sides is _____

B. Polygon Exterior Angle Sum Theorem – The _____ of the _____ angle measures, one at each vertex, of a _____ polygon is _____.

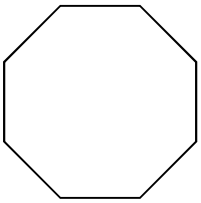
Angles in Polygons Exploration

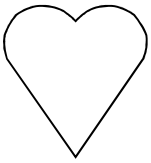
Name of polygon	Number of Sides	Number of Diagonals from a vertex	Number of triangles in polygon	Sum of interior angles	Measure or one interior angle (Regular Only)	Measure of one exterior angle (Regular Only)	Sum of exterior angles
Triangle 							
Quadrilateral 							
Pentagon 							
Hexagon 							
Heptagon 							
Octagon 							
Nonagon 							
Decagon 							
n-gon							

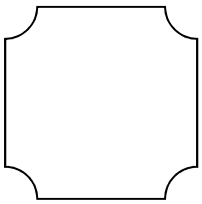
Guided Practice	On Your Own
Find the sum of the interior angles of a regular dodecagon.	Find the sum of the interior angles of an regular 15-gon
Find the sum of the exterior angles of a regular pentagon.	Find the sum of the exterior angles of a regular hendecagon.
Name the regular polygon that each exterior angle has a measure of 30^{o}.	Name the regular polygon that each exterior angle has a measure of 120^{o}.
Name the regular polygon that each interior angle has a measure of 144^{o}.	Name the regular polygon that each interior angle has a measure of 135^{o}.
Find the value of x 	Find the value of x 

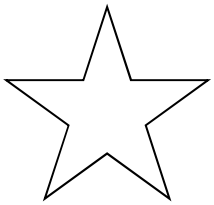
Polygons – Assignment

Tell whether each shape is a polygon. If it is a polygon, name it by the number of sides.

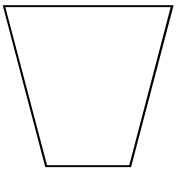
1) 

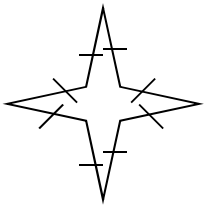
2) 

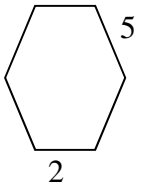
3) 

4) 

Tell whether each polygon is concave or convex and if it is regular or irregular.

5) 

6) 

7) 

8) 

9) Draw the following, or tell why it cannot be drawn.

A. Concave equilateral pentagon

B. Concave trapezoid

C. Irregular Equilateral triangle

D. Convex irregular heptagon

10) Tell whether each statement is Always, Sometimes, or Never true.

A. An equiangular triangle is a regular convex polygon

B. A convex pentagon is a regular polygon

C. A equilateral dodecagon is equiangular

D. A concave polygon is irregular.

E. Regular octagons are similar polygons.

F. A dodecagon has 12 sides.

G. A nine sided polygon is a nonagon.

11) Fill in the chart for the regular polygons.

Polygon	Sum of Interior ∠'s	Each Interior ∠	Sum of Exterior ∠'s	Each Exterior ∠
heptagon				
20-gon				
pentagon				
	1440°			
12-gon				
hexagon				
				40°
36-gon				
		60°		
				90°

12) If the sum of the interior angles is 1980°, what is the name of the polygon?

13) If each of the exterior angles is 15°, what is the name of the polygon?

14) If each on the interior angles is 108°, what is the name of the polygon?

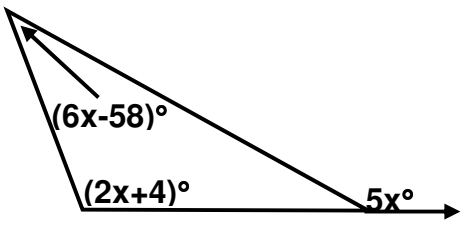
15) If the sum of the interior angles is 3600°, what is the name of the polygon?

16) If each of the exterior angles is 24°, what is the name of the polygon?

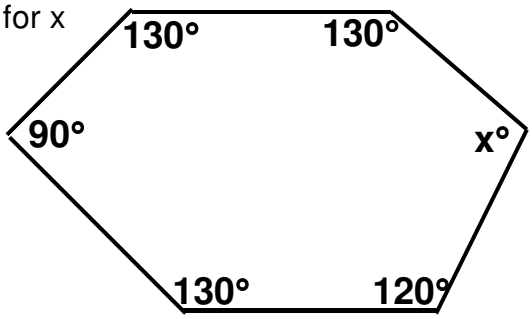
17) If each of the interior angles is 135°, what is the name of the polygon?

18) If each interior angle is 160°, what is the name of the polygon?

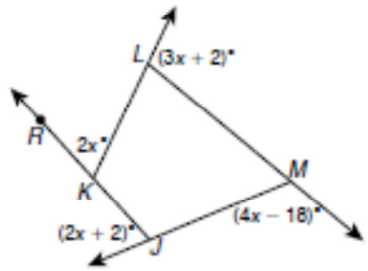
19) Solve for x



20) Solve for x



21) Find the measure of $\angle RKL$.



A 34°
B 68°
C 86°
D 148°

22) Three interior angles of a convex heptagon measure 125°, and two of the interior angles measure 143°. Which are possible measures for the other two interior angles of the heptagon?

F 48° and 48°
G 39° and 100°
H 100° and 116°
J 89° and 150°

23) For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?

(1) hexagon
(2) pentagon
(3) quadrilateral
(4) triangle

24) A pentagon has two exterior angles that measure $(3x)°$, two exterior angles that measure $(2x + 22)°$, and an exterior angle that measures $(x + 41)°$. If all of these angles have different vertices, what are the measures of the exterior angles of the pentagon?

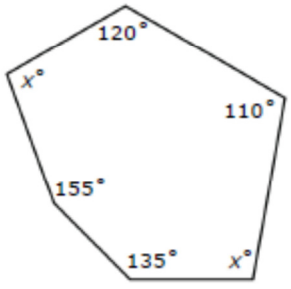
25) **The sum of the interior angles of a polygon is the same as the sum of its exterior angles. What type of polygon is it?**

A quadrilateral
B hexagon
C octagon
D decagon

26) **The measures of the interior angles of a pentagon are $2x, 6x, 4x-6, 2x-16$, and $6x+2$. What is the measure, in degrees, of the largest angle?**

A 28
B 106
C 170
D 174

27) Which equation could best be used to determine the value of x?

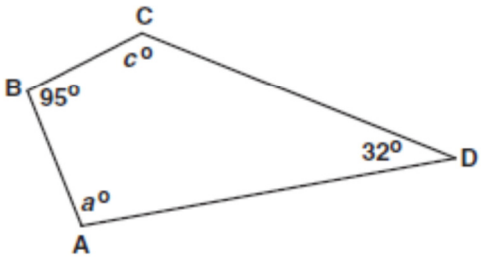


A $120° + 110° + x° + 135° + 155° + x° = 720°$
B $120° + 110° + x° + 135° + 155° + x° = 540°$
C $120° + 110° + x° + 135° + 155° + x° = 360°$
D $120° + 110° + x° + 135° + 155° + x° = 180°$

28) **A regular polygon has 12 sides. What is the measure of each exterior angle?**

A 15°
B 30°
C 45°
D 60°

29) **For the quadrilateral shown below, what is $m\angle a + m\angle c$?**



A 53°

B 137°

C 180°

D 233°

30) The measure of one interior angle of a regular polygon is two times the measure of one of its exterior angles. How many sides does this polygon have?

31) **If the measure of an exterior angle of a regular polygon is 120°, how many sides does the polygon have?**

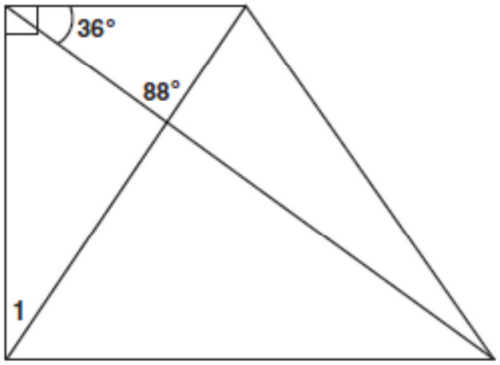
A 3

B 4

C 5

D 6

32) **What is $m\angle 1$?**



A 34°

B 56°

C 64°

D 92°

33) **What is the measure of an exterior angle of a regular hexagon?**

A 30°

B 60°

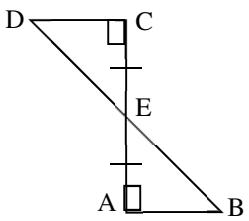
C 120°

D 180°

SPIRAL REVIEW

For each pair of triangles, tell: (a) Are they congruent (b) Write the triangle congruency statement. (c) Give the postulate that makes them congruent.

1.

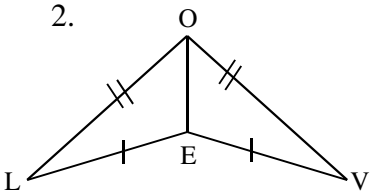


a. _____

b. Δ_____ ≅ Δ _____

c. _____

2.

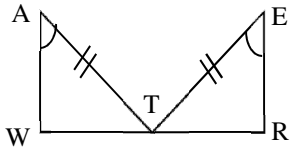


a. _____

b. Δ_____ ≅ Δ _____

c. _____

3. Given: T is the midpoint of $\overline{WR}$

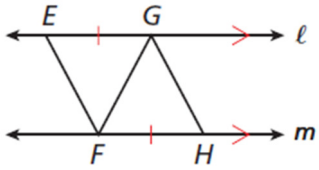


a. _____

b. Δ_____ ≅ Δ _____

c. _____

4.

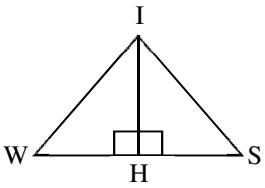


a. _____

b. Δ_____ ≅ Δ _____

c. _____

5. Given: $\overrightarrow{IH}$ Bisects ∠WIS

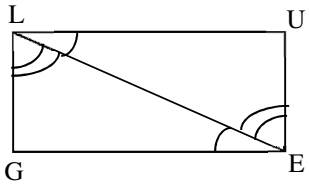


a. _____

b. Δ_____ ≅ Δ _____

c. _____

6.

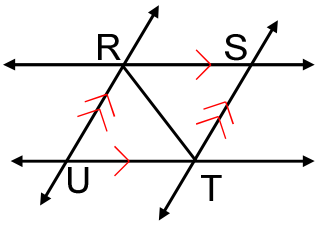


a. _____

b. Δ_____ ≅ Δ _____

c. _____

7.

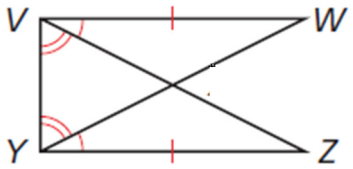


a. _____

b. Δ_____ ≅ Δ _____

c. _____

8.

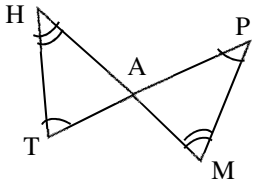


a. _____

b. Δ_____ ≅ Δ _____

c. _____

9.



a. _____

b. Δ_____ ≅ Δ _____

c. _____