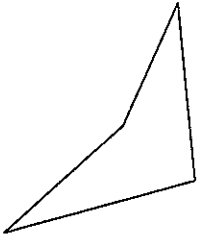


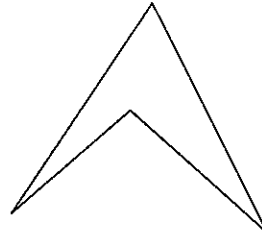
Assignment

State if each polygon is concave or convex.

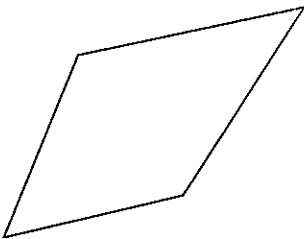
1)



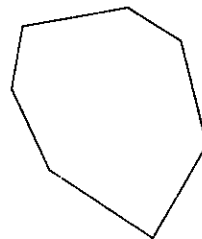
2)



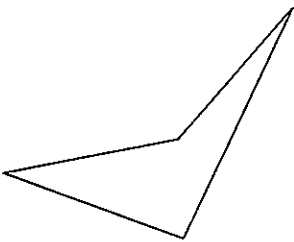
3)



4)

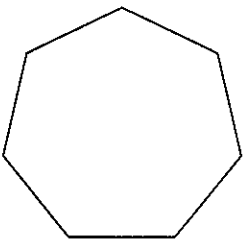


5)

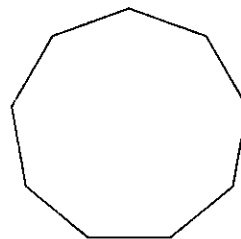


Write the name of each polygon.

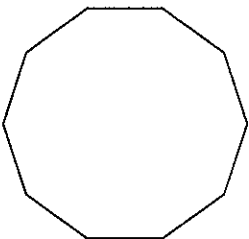
6)



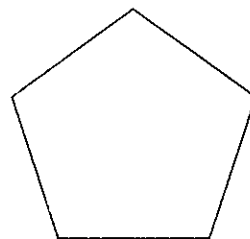
7)



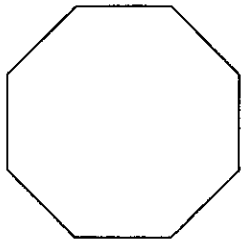
8)



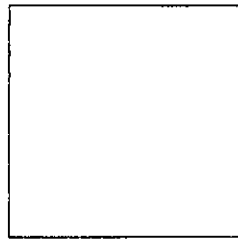
9)



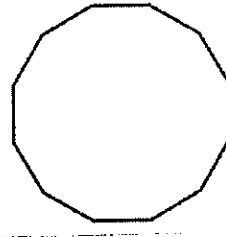
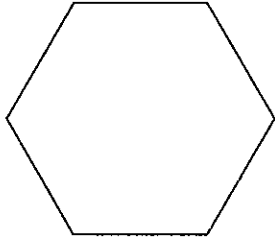
10)



11)

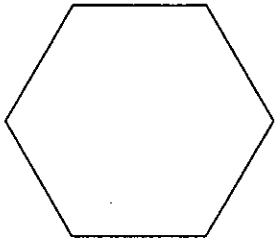


12)

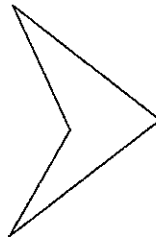


State if each polygon is regular or not.

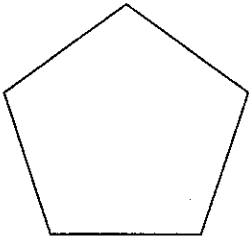
13)



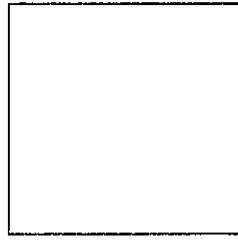
14)



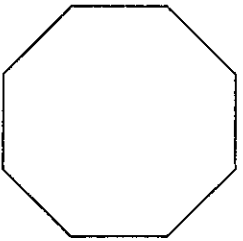
15)



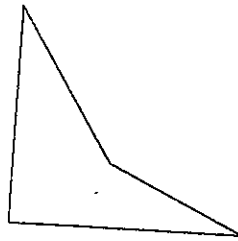
16)



17)

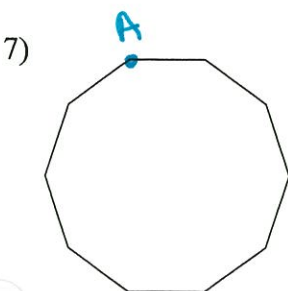
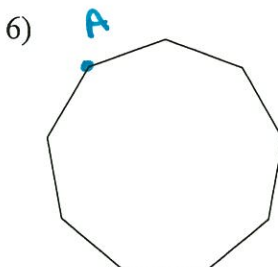
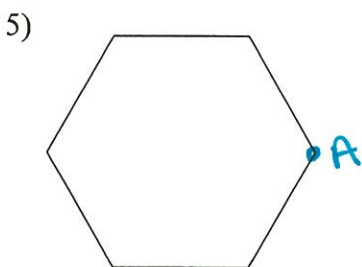
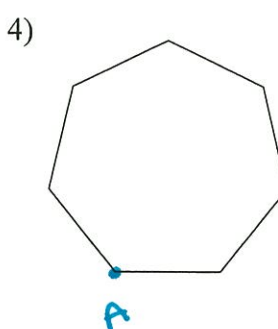
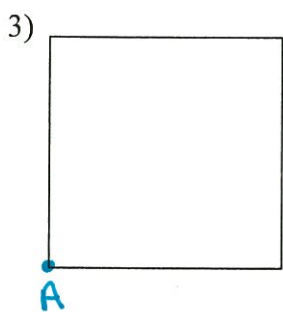
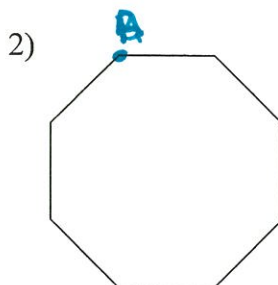
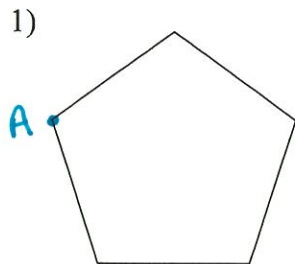


18)



Assignment

Write the name of each polygon and draw your diagonals starting from corner A.



Name: _____

The Sum of Polygon Angle Measures

You can use triangles and the Triangle Angle-Sum Theorem to find the sum of the measures of the angles of a polygon. Record your data in the table below...

1. Determine the number of sides and the name of each polygon.
2. Divide your polygon into triangles by drawing all diagonals that are possible from **ONE** vertex to the others.
3. Determine the number of triangles formed.
4. Multiply the number of triangles by 180 to find the sum of the measures of the angles of each polygon.

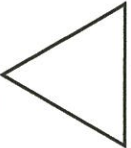
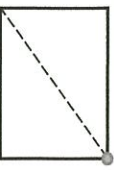
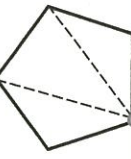
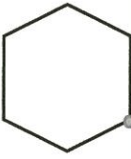


Number of Sides	Polygon (Name & Drawing)	Number of Triangles Formed	Sum of the Interior Angle Measures
3		_____	_____ • 180 = _____
4		_____	_____ • 180 = _____
5		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
		_____	_____ • 180 = _____
n		_____	_____ • 180 = _____

5. Look for a pattern. Write a rule for the sum of the measures of the angles of an n -gon.

Polygon Angle-Sum Theorem

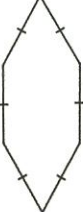
The sum of the measures of the angles of an n -gon is _____.


Polygon Angles Investigation


						n
Number of sides						
Name of polygon						
Number of triangles (after triangulating)						
Sum of interior angles						
Each interior angle measure (regular polygon)						
Each exterior angle measure (regular polygon)						
Sum of exterior angles						

Key Idea 1: To find the sum of the interior angles measures _____

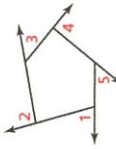
Key Vocab:

Equilateral 

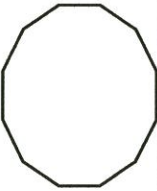
Equiangular 

Regular 

Key Idea 2: The sum of the exterior angles measures _____°.

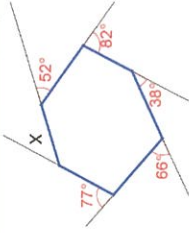


Example: Find the sum of the interior angles.



Example: If the sum of the interior angles of a polygon is 1620°, how many sides does it have?

Example: Find x.

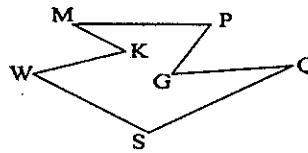
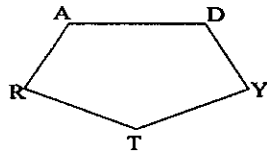


Name _____

Exterior Angles of Polygons

Naming Polygons

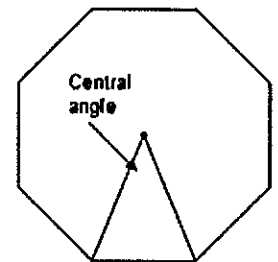
To name a polygon, pick any vertex and list the label of each vertex in consecutive order. It doesn't matter if you go clockwise or counter-clockwise; just pick a direction and go. Name the two polygons below.



Central Angles

The center of a regular polygon is the equidistant from any vertex. The central angle has its vertex at the center.

Polygon	Number of Sides of Polygon (n)	Measure of the Central Angle
Triangle		
Quadrilateral		
Pentagon		
Hexagon		
n-sides		

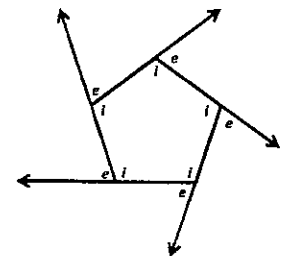


Exterior Angle

The Exterior Angle is the angle between any side of a shape, and a line extended from the next side.

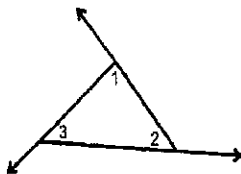
How many exterior angles does the polygon to the left have? _____

What is the relationship between e and i? _____

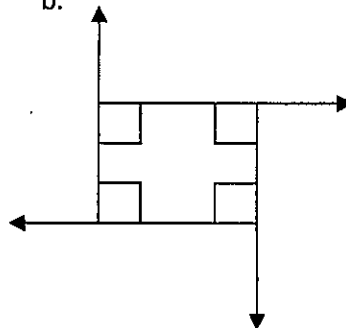


1. Find the sum of the exterior angles of each polygon.

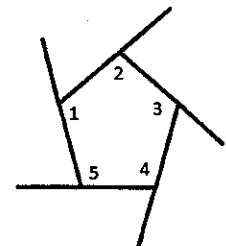
a. $m\angle 1 = 50$, $m\angle 2 = 60$, $m\angle 3 = 70$.



b.



c. This is a regular pentagon.



Exterior Angle Sum

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

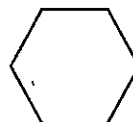
Single Exterior Angle of a Regular Polygon

To find a single, exterior angle of a regular polygon, divide the sum of the exterior angles by the number of sides of the polygon.

1. Find the measure of each exterior angle of a regular hexagon.

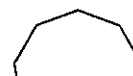
Number of sides of a hexagon = _____

Each Exterior Angle = _____



2. Find the measure of each exterior angle of a regular nonagon.

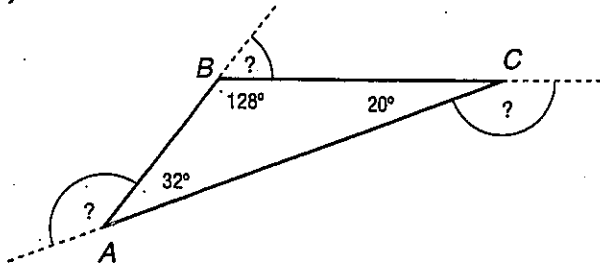
Number of sides of a nonagon = _____



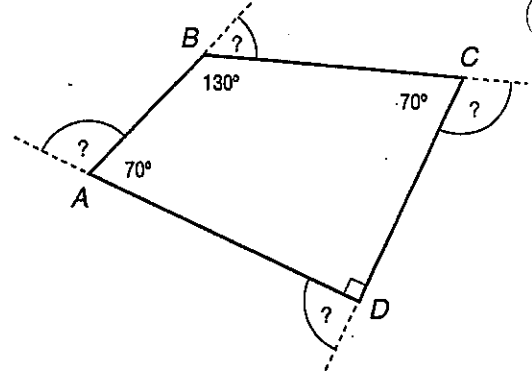
(D)

11. For each figure, find the exterior angle measures and the sum of the exterior angle measures.

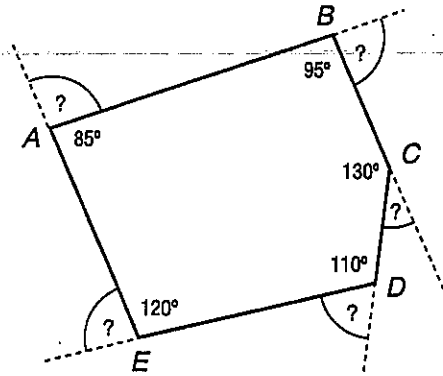
a)



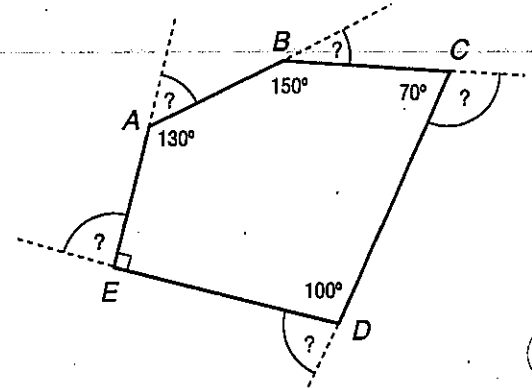
b)



c)



d)



12. Complete the following statement.

The sum of the measures of the exterior angles of a convex polygon is always _____.

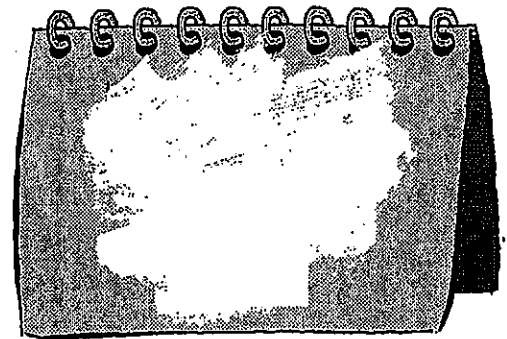
13. Complete the table.

Number of sides	Sum of angle measures	
	interior	exterior
3	180°	360°
4		
6		
8		
10		
...		
n		360°

(4)

5. # of Δ inside?

- a) 7 sides? _____
- b) 12 sides? _____
- c) 10 sides? _____



6. 1 degree of 1 ext' angle of a polygon with:

- a) 20 Sides _____
- b) 9 Sides _____
- c) 35 Δ _____

7. Give the sum of the interior angles for:

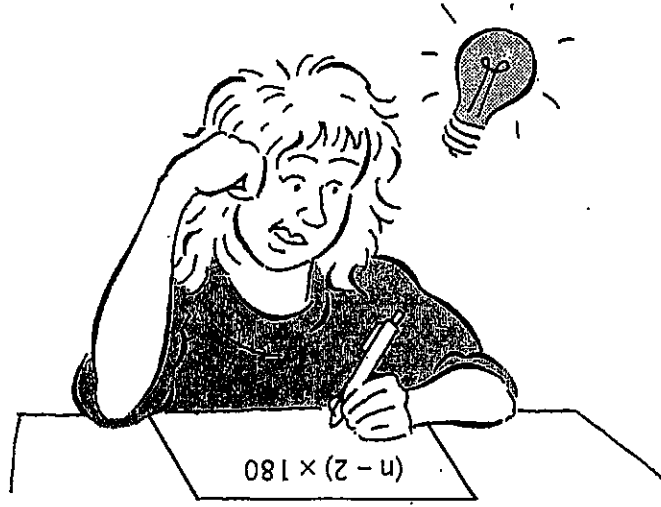
- a) a square. _____
- b) a pentagon. _____
- c) an octagon. _____

8. Give the sum of the interior angles for a polygon with:

- a) 12 sides? _____
- b) 20 sides? _____
- c) 100 sides? _____

9. Calculate the number of sides in a polygon if the sum of the interior angles is:

- a) 1980° . _____
- b) 3060° . _____
- c) 2160° . _____



10. True or false?

- a) It is possible to construct a concave triangle. _____
- b) In a convex polygon, one angle must be greater than 180° . _____
- c) In a convex polygon, the sum of the interior and exterior angles at each vertex is 180° . _____
- d) The only polygon with no diagonal is a triangle. _____
- e) The sum of the interior angles of a pentagon is greater than that of a hexagon. _____