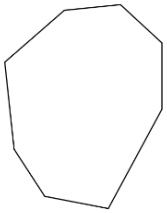
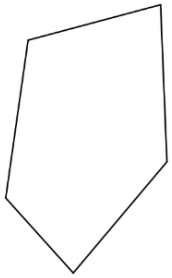
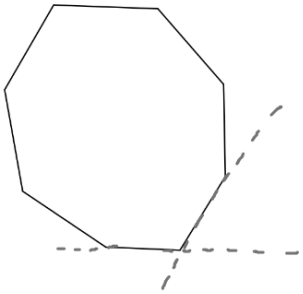
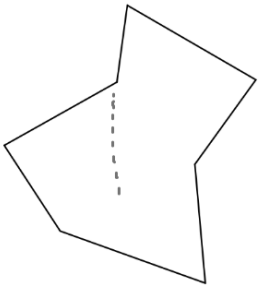
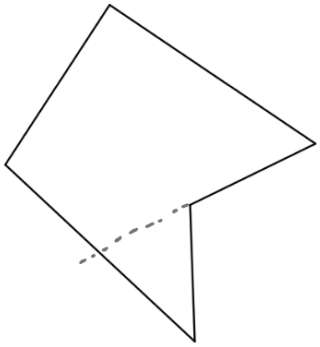
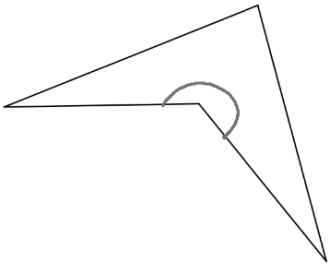
Polygon - A two-dimensional closed shape with straight sides. It does not have curved sides. Each side has only two points of intersection.

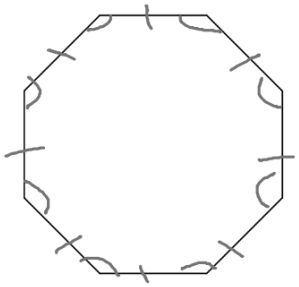
Convex Polygon - All the interior angles must be less than 180 degrees.
95% No extented side will pass through the interior of the polygon.

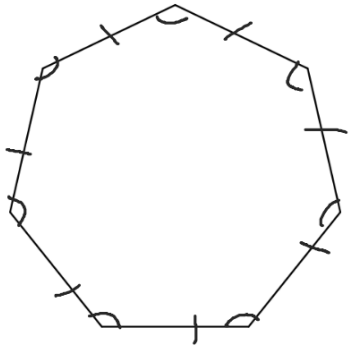




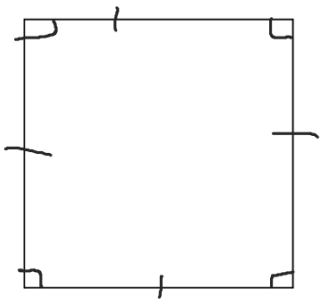
Concave Polygon - An interior angle can be more than 180 degrees. If a side is extented then the side will pass through the interior of the polygon.

Regular Polygon - All sides are congruent and all angles are congruent.
It is equilateral and equiangular.







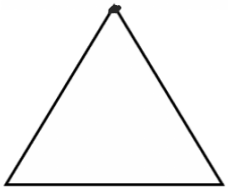
Name a polygon by the number of sides.

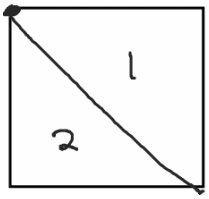
Number of Sides	Name of Polygon	
3	Triangle	
4	Quadrilateral	
5	Pentagon	
6	Hexagon	
7	Septagon Heptagon	
8	Octagon	
9	Nonagon	
10	Decagon	
11	11-gon	
12	dodecagon	

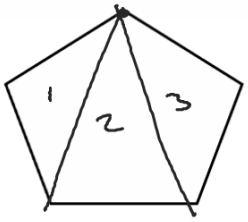
13 13-gon

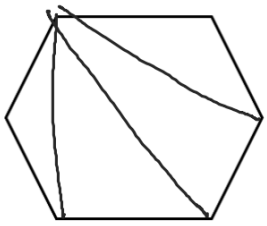
n n-gon

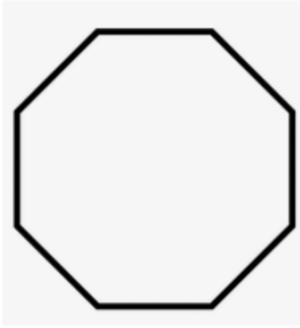
Polygon	Triangle	Quadrilateral	Pentagon	Hexagon	Heptagon	Octagon	
# Sides	3	4	5	6	7	8	★
# of diagonals from a vertex	0	1	2	3	4	5	
# of Triangles	1	2	3	4	5	6	
Sum of the Interior Angles	180	360	540	720	900	1080	★











Polygon Interior Angle-Sum Theorem

The sum of the measures of the interior angles of a convex n-gon is $180 \cdot (n-2)$.

Sum of Interior angles $= 180(n-2)$

n = number of sides

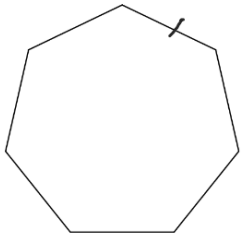
Measure of Each Interior Angle of a Regular Polygon.

The measure of an interior angle of a regular n-gon is $\frac{180 \cdot (n-2)}{n}$.

Find the sum of the interior angles for each polygon.

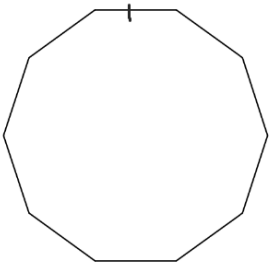
$S = 180(7-2)$

$180(5) = 900$



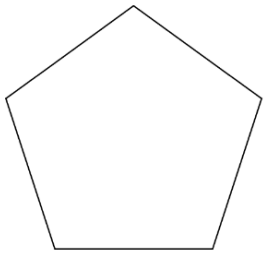
$S = 180(10-2)$

$180(8) = 1440$

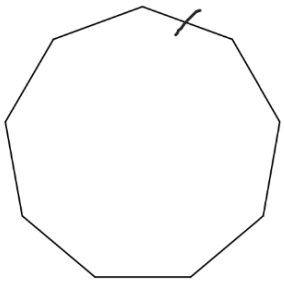


$S = 180(5-2)$

$180(3) = 540$



$n = 9$



$S = 180(9-2)$

$180(7)$

$S = 1260$

A regular 18-gon

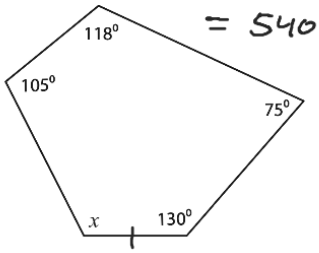
$S = 180(18-2)$

$= 180(16)$

$= 2880$

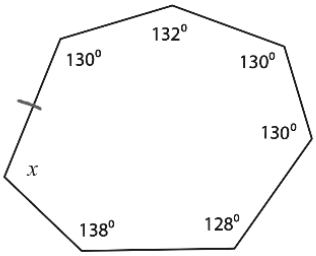
Find the value of x

$S = 180(5-2)$
$= 540$



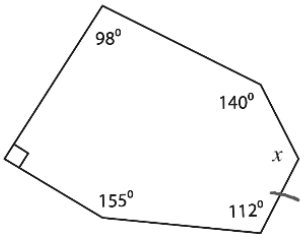
$x + 130 + 75 + 118 + 105 = 540$
$x + 428 = 540$
$x = 112°$

$S = 180(7-2)$
$= 900$

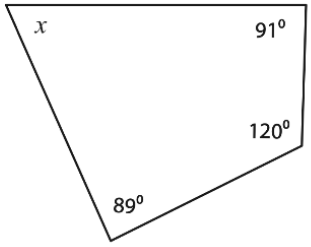


$x + 130 + 132 + 130 + 130 + 128 + 138 = 900$
$x + 788 = 900$
$x = 112°$

$S = 180(6-2)$
$= 720$

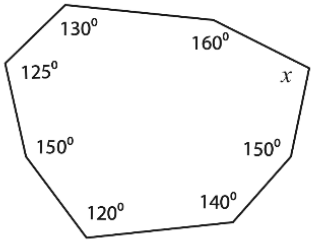


$x + 112 + 155 + 90 + 98 + 140 = 720$
$x + 595 = 720$
$x = 125°$



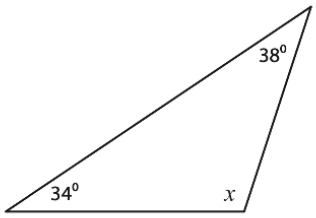
$S = 180(4-2)$
$= 360$

$x + 91 + 120 + 89 = 360$
$x + 300 = 360$
$x = 60$



$S = 180(8-2)$
$= 1080$

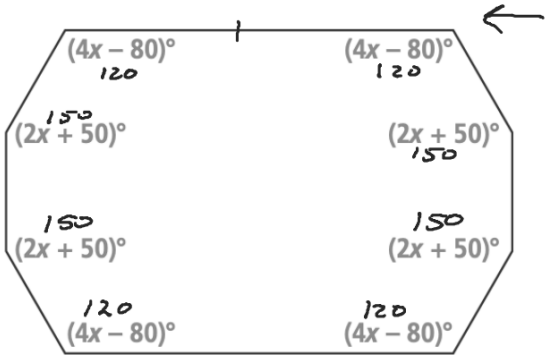
$x + 150 + 140 + 120 + 130 + 125 + 130 + 160 = 1080$
$x + 975 = 1080$
$x = 105$



$S = 180(3-2)$

$180 = x + 38 + 34$
$180 = x + 72$
$x = 108$

Find the value of x and the measure of each interior angle.



$1080 = 4(4x-80) + 4(2x+50)$

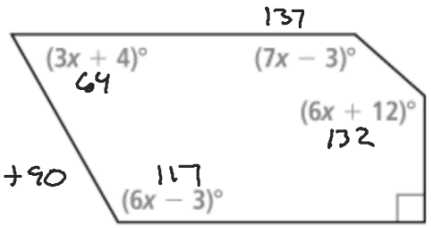
$16x - 320 + 8x + 200$

$1080 = 24x - 120$

$1200 = 24x$

$x = 50$

What are the measures of the interior angles of the pentagon shown?



SOLUTION

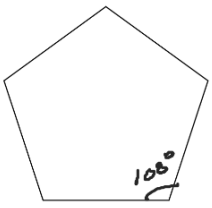
$540 = 3x+4+7x-3+6x+12+6x-3+90$

$22x+100 = 540$

$22x = 440$

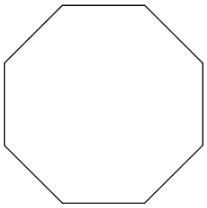
$x = 20$

Find the measure of each interior angle for each regular polygon.



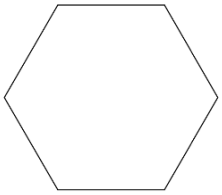
$\frac{5}{n} = \frac{180(5-2)}{5}$

$= 108°$

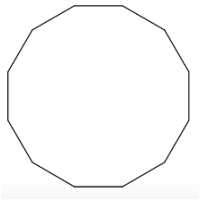


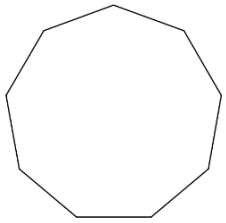
$\frac{180(8-2)}{8}$

$135°$



$\frac{180(6-2)}{6} = 120°$





a regular 16-gon