

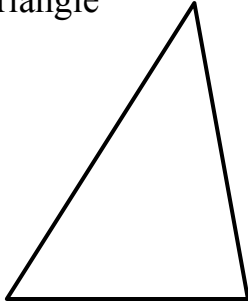
# Polygons & Parallelograms

Properties & Attributes

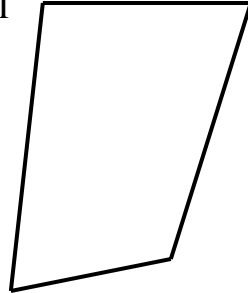
# A few polygons

**Regular polygons** are both equilateral and equiangular

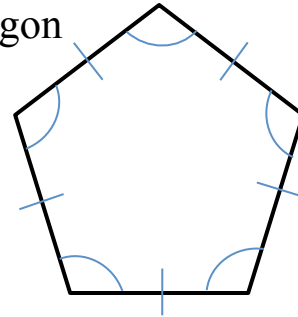
Triangle



Quadrilateral  
(much more  
on these  
later)

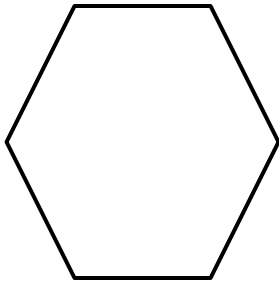


Pentagon

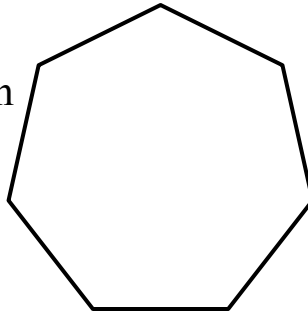


This would be called a  
regular pentagon  
because...

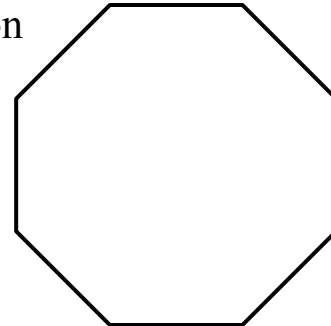
Hexagon



Heptagon



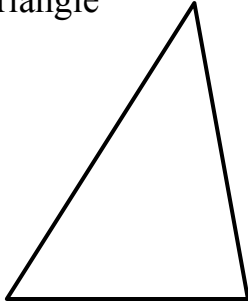
Octagon



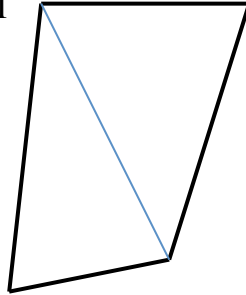
## A few polygons

Note that if you draw diagonals from any one vertex of a polygon to the remaining corners they divide the interior into triangles

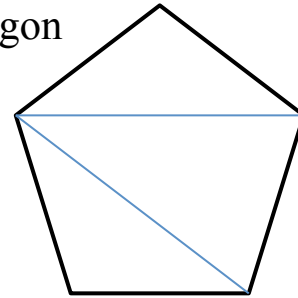
Triangle



Quadrilateral  
(much more  
on these  
later)



Pentagon

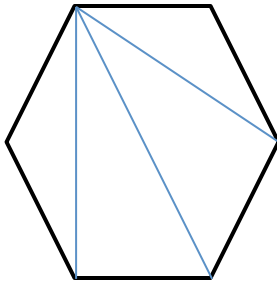


4 sides gives you  
2 triangles

5 sides gives you  
3 triangles

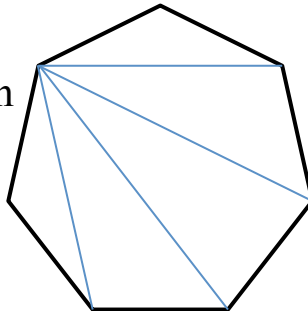
Why does this matter?

Hexagon



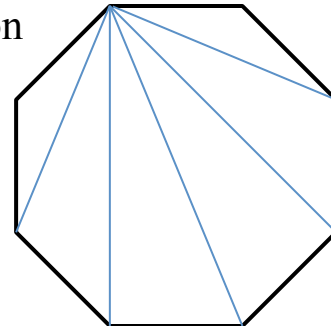
6 sides gives you  
4 triangles

Heptagon



7 sides gives you  
5 triangles

Octagon



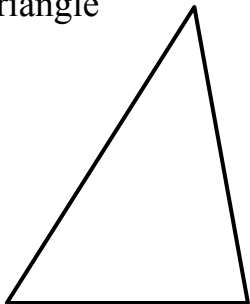
8 sides gives you  
6 triangles

## Polygon Angle Sum Theorem (pg 395)

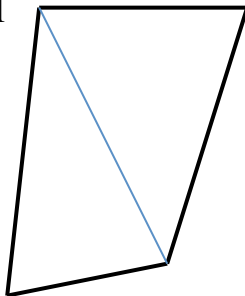
If each triangle has  $180^\circ$  of angle measurements inside then the interior angles of a convex polygon add up to  $(n - 2)180^\circ$   $n$  here represents the number of sides in the polygon

But wait! What does convex mean?

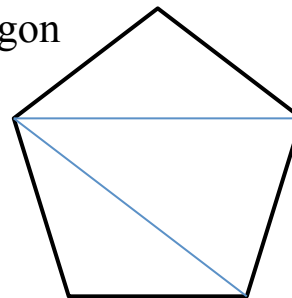
Triangle



Quadrilateral  
(much more  
on these  
later)



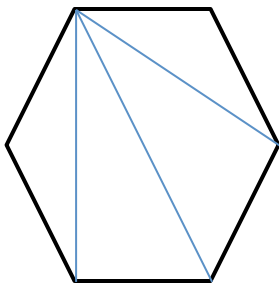
Pentagon



4 sides gives you  
2 triangles

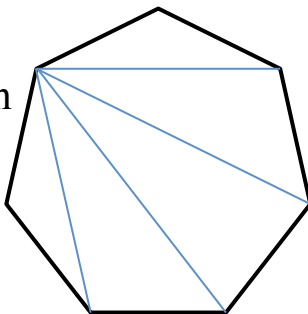
5 sides gives you  
3 triangles

Hexagon



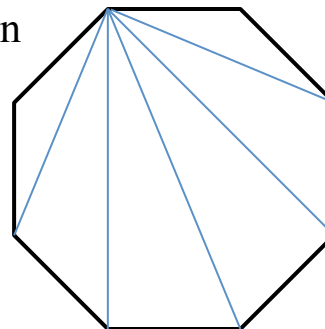
6 sides gives you  
4 triangles

Heptagon



7 sides gives you  
5 triangles

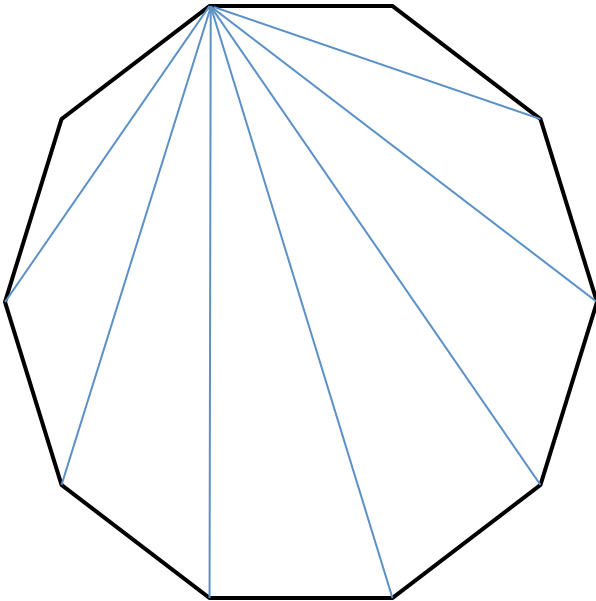
Octagon



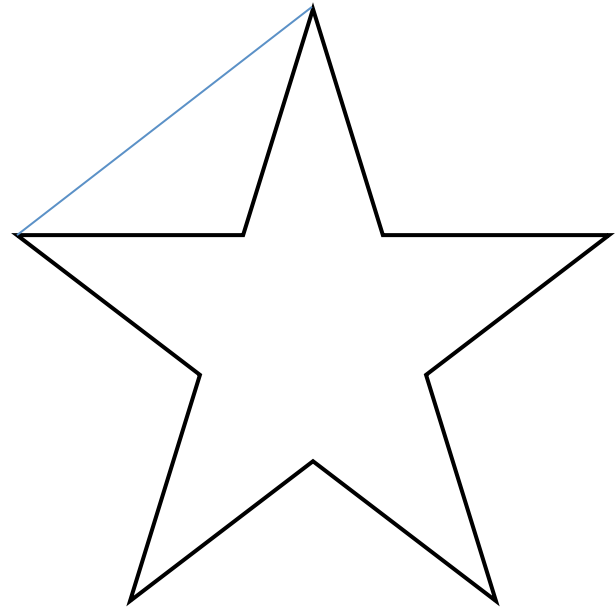
8 sides gives you  
6 triangles

## Here is a Regular Decagon

Convex Decagon



Concave Decagon



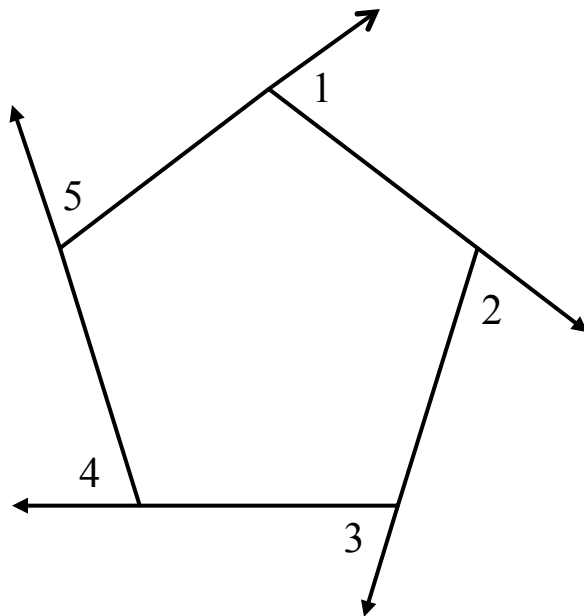
So what's the difference between convex and concave?

In a convex polygon, all diagonals are inside the figure

In a concave polygon, at least one diagonal goes outside the figure

## Finally, the **Polygon Exterior Angle Theorem** (pg 396)

It says simply that



$$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 180^\circ$$

As long as the polygon is convex