SHAPES

Chapter 2: Advanced Polygons

Before we start...
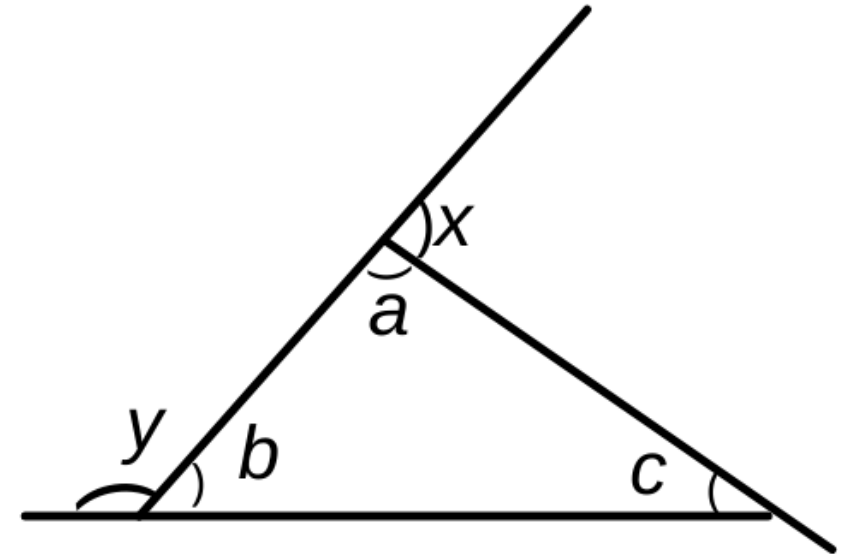
Let's Recap:

Interior Angle:
An interior angle of a polygon is an angle inside the polygon at one of its vertices.
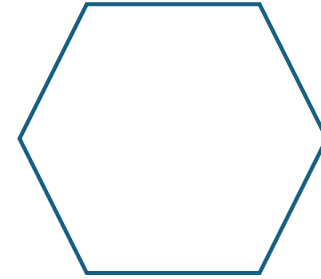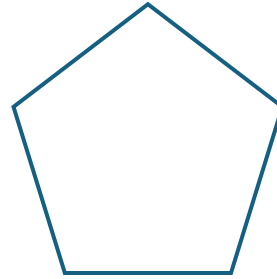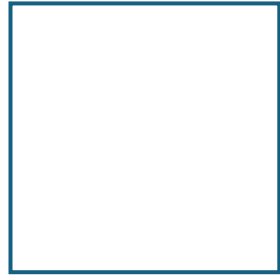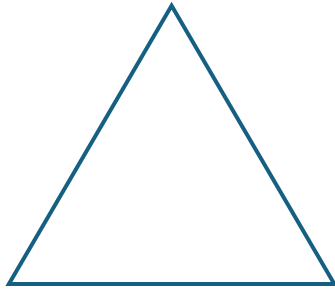Angle a , b , c are interior angle

Exterior Angle:
An exterior angle of a polygon is an angle outside the polygon formed by one of its sides and the extension of an adjacent side
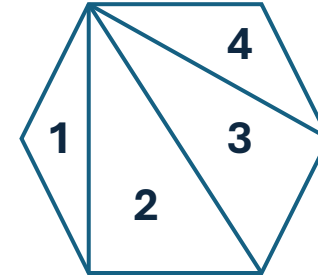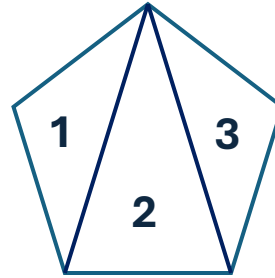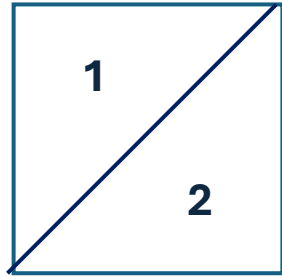Angle x , y are exterior angle

Interior Angles of Advanced Polygons

To understand the sum of the interior angles of polygons:

1. Connect the edges of each polygons above to form a tiangle in the polygon

Interior Angles of Advanced Polygons
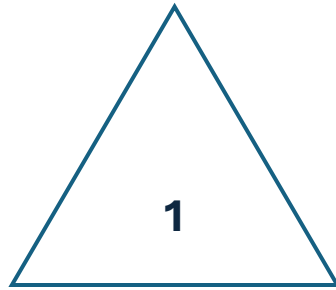
2. Complete the table below according to the figures shown above.

Polygon	Number of Sides (n)	Number of triangles	Total sum of Interior Angles
Triangle	3	1	1 x 180° = 180°
Square	4	2	2 x 180° = 360°
Pentagon			
Hexagon			

Interior Angles of Advanced Polygons
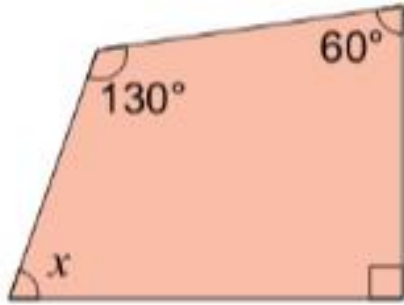
- Total sum of interior angles of a polygon:

$$(n - 2) \times 180°$$

- Interior angle of **regular** polygon:

$$\frac{(n - 2) \times 180°}{n}$$

Interior Angles of Advanced Polygons

Total sum of interior angles,

$= (n - 2) \times 180°$

$= (4 - 2) \times 180°$

$= 360°$

$x + 130° + 60° + 90° = 360°$

$x + 280° = 360°$

$x = 360° - 280°$

$x = 80°$

Calculate the value of the interior angle for a regular hexagon.

Solution:

Number of sides of regular hexagon, $n = 6$

Total sum of interior angles

$= (n - 2) \times 180°$

$= (6 - 2) \times 180°$

$= 4 \times 180°$

$= 720°$

$\text{Interior angle} = \dfrac{\text{Total sum of interior angles}}{\text{Number of sides}}$

$= \dfrac{720°}{6}$

$= 120°$

Exterior Angles of Advanced Polygons

No matter what, the exterior angles of a polygon is 360°

Calculate the value of b for the diagram on the right.

Solution:

$360° = (30° + b + b + 50° + 45° + 15° + 60° + 30°)$
$360° = 230° + 2b$
$2b = 360° - 230°$
$2b = 130°$
$b = 65°$