CSEC TECHNICAL DRAWING

GEOMETRICAL DRAWING

OBJECTIVE: S2A: PLANE GEOMETRY

Polygons:
(i) definitions (regular and irregular polygons);
(ii) types;
(iii) properties;

At the end of the lesson, you should be able to:

- Define the term polygon
- Identify different regular polygons given their number of sides
- Calculate the size of an interior and exterior angle to a regular polygon

Definition:

A **polygon** is a plane figure (2 dimensional) bounded by three or more straight lines with internal angles equal to 360°.

Polygons can either be regular or irregular. A ***regular*** polygon has all sides and internal angles equal. An ***irregular*** polygon has sides and angles that are not equal.

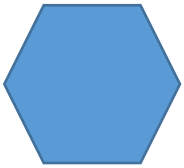
Classification of regular polygons:

Regular polygons are named for their number of sides.

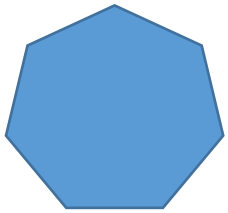
Triangle

Quadrilateral

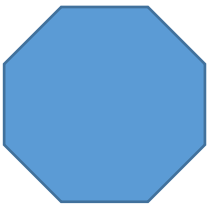
Pentagon



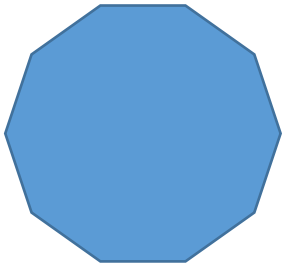
Hexagon



Heptagon



Octagon

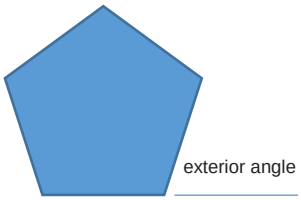


Decagon

- ✓ **Pentagon** - 5 sides
- ✓ **Hexagon** - 6 sides
- ✓ **Heptagon** - 7 sides
- ✓ **Octagon** - 8 sides
- ✓ **Nonagon** - 9 sides
- ✓ **Decagon** - 10 sides.

Angles in a regular polygon:

The interior and exterior angles of regular polygons can be calculated mathematically given the number of sides of the polygon.



The sum of the interior and exterior angle of a polygon equals 180°.

The formula to calculate the size of an interior angle in a regular polygon is as follows:

$$\text{Internal angle} = \frac{180(n-2)}{n}$$ ***where n = number of sides***

Consequently, the sum of an exterior angle in a regular polygon can be found by:

- First calculating the sum of the interior angles
- Then subtracting it from 180°.

For example:

A six sided regular polygon is called a hexagon.

1. The size of the interior angle of a hexagon: $\frac{180(n-2)}{}$

n

$$\frac{180(6-2)}{6} = \frac{720}{6} = 120$$

2. Subtract: 180° -120° = 60