

## Properties of Polygon

### Properties of Polygon

- **Polygon:** It is a closed plane figure bounded by three or more than three straight lines. There are of two types of polygons. Only regular polygon is in the syllabus of SSC CGL
- **Regular Polygon:** All the sides are equal and also all the interior angles are equal  
Sum of Interior angles of a polygon =  $(n - 2) \times 180$   
 $n \rightarrow$  number of sides  
Sum of exterior angle = 360

### Important Formulae Related to Regular Polygon :

$$\rightarrow \text{Area} = \frac{1}{2} \times P \times r$$

$\nearrow$  radius of inscribed circle.  
 $\searrow$  Perimeter of Polygon =  $n \times a \rightarrow$  length of one side

$$\rightarrow \text{Area} = \frac{1}{2} \times P \times \sqrt{R^2 - \left(\frac{a}{2}\right)^2}$$

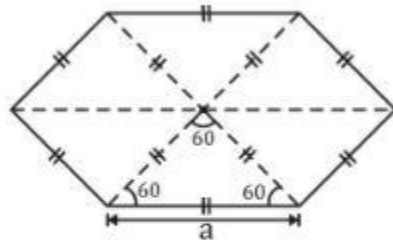
$\searrow$  Radius of Circum Scribed Circle  
 $\nearrow$  Perimeter =  $n \times a$

$$\rightarrow R \text{ (circum circle radius)}$$

$$= \frac{a}{2} \operatorname{cosec} \frac{180^\circ}{n}$$

$$\rightarrow \text{Area} = \frac{na^2}{4} \cot \frac{\pi}{n} \rightarrow \text{No. of sides}$$

### Regular Hexagon (n = 6) :->



$$\rightarrow \pi \text{ (Inradius)} = \frac{\sqrt{3}}{2} a$$

$$\rightarrow R \text{ (Circum radius)} = a$$

$$\rightarrow \text{Area} = \frac{3\sqrt{3}}{2} a^2$$

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## Regular Octagon

$$\text{Area} = 2(\sqrt{2} + 1)(\text{side})^2$$

### Properties of Polygon:-

→ Sum of all angle of an n-sided Polygon is:-  $(n - 2) \times 180$

$$\text{Each angle of an Regular Polygon} \rightarrow \frac{(n - 2) \times 180}{n}$$

→ Sum of All the Exterior Angles of a polygon →  $360^\circ$

→ n - Sided polygon has  $\frac{n(n - 3)}{2}$  diagonals

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