CHAPTER 09

Area of Plane Figures

Area of the circle:

Draw a circle divide into 16 equal sectors by drawing 2 perpendicular diameter first and successively bisecting each of the angles between them twice and so on.

Separate the sectors and arrange them as shown in figure. The arrangements nearly takes the shape of a rectangle, length of rectangle is half the circumference and breadth is equal to radius.

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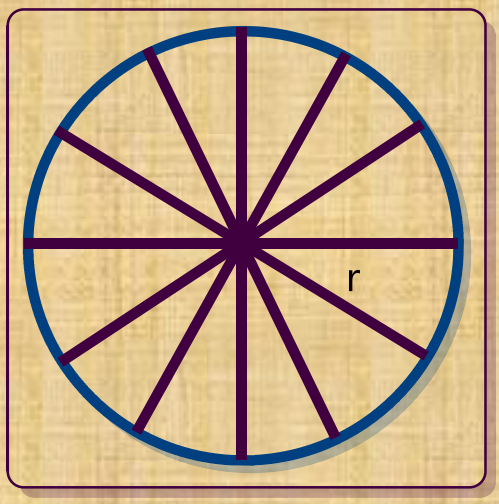
Now, area of rectangle = $l.\ b$

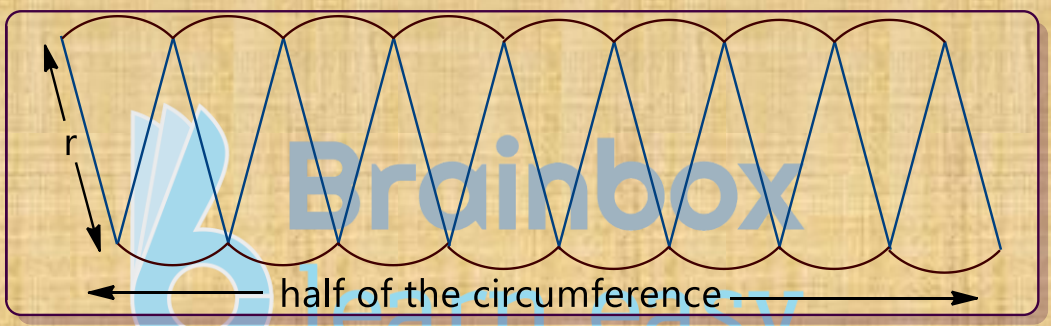
$= \pi r.\ r$

$= \pi.\ r^2$

Area of the circle = πr^2

$= \frac{\pi d^2}{4}$ (d = diameter)





Example:

Let the radius of a circle be 24.5 cm. Find the following.

(i) The circumference of the circle.

(ii) The area of the circle.

Sol.

Given,

Radius of the circle (r) = 24.5 cm

(i) The circumference of the circle = $2\pi r$

$$= 2 \times \frac{22}{\cancel{7}_{1}} \times \cancel{24.5}^{3.5}$$

$$= 44 \times 3.5$$

The circumference of the circle = 154 cm

(ii) The area of the circle = $\pi r^2 = \frac{22}{7} \times (24.5)^2$

$$= \frac{22}{\cancel{7}_{1}} \times \cancel{24.5}^{3.5} \times 24.5$$

$$= 22 \times 85.75$$

The area of the circle = 1,886.5 cm^2

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