Areas Related To Circles

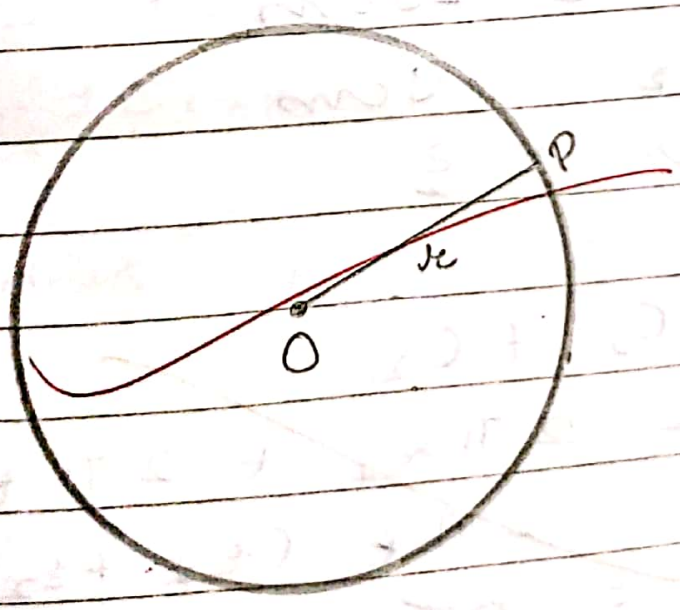
Perimeter and Area of Circle

If 'r' is the radius of circle with centre O, then the perimeter of circle, i.e., circumference of circle is the circular length and is denoted by 'C' and is given by

$$C = \pi d \quad \text{or} \quad C = 2\pi r$$

Also, if 'A' is the area of circle then

$$A = \pi r^2$$



The radii - - - - - - - - - - two circles.

Let r_1 & r_2 be the radii of two circles with circumferences C_1 & C_2.

Let r & C be the radius and circumference of required circle

$r_1 = 19\ cm$

$r_2 = 9\ cm$

$r = ?$

$C = C_1 + C_2$

$2\pi r = 2\pi r_1 + 2\pi r_2$

$2\pi r = 2\pi r (r_1 + r_2)$

$2\pi r = 2\pi r (19 + 9)$

$r = 28\ cm$

∴ Radius of tuned circle is 28 cm.

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The radii _ _ _ _ _ _ _ _ _ _ _ _ two circles.

Let r_1 & r_2 be the radii of circle.
A_1 & A_2 be the area of circle

Let r & A be the radius and area of circle.

$r_1 = 8$ cm
$r_2 = 6$ cm

$A = A_1 + A_2$

$\pi r^2 = \pi r_1^2 + \pi r_2^2$

$\pi r^2 = \pi (r_1^2 + r_2^2)$

$\pi r^2 = \pi (8^2 + 6^2)$

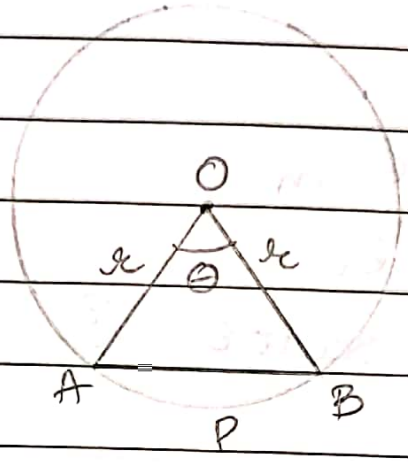
$r^2 = 64 + 36$

$r^2 = 100$

$r = 10$ cm

∴ Radius of third circle is 10 cm

Area of Sector and Segment of a Circle



Length on an arc APB is given by

i) Length of arc $= \frac{\theta}{360^\circ} \times 2\pi r$

(ii) Area of sector θ-APB $= \frac{\theta}{360^\circ} \times \pi r^2$

(iii) Area of segment = Area of sector − Area of triangle

$= \frac{\theta}{360^\circ} \times \pi r^2 - \frac{1}{2} r^2 \sin\theta$

Find ------ sector of 60°.

Given :

$r = 6\ cm$

$\theta = 60°$

Area of sector = ?

$$\text{Area of sector} = \frac{\theta}{360°} \times \pi r^2$$

$$= \frac{1}{6} \times \frac{22}{7} \times 6 \times 6$$

$$= \frac{132}{7}$$

$$= 18.85\ cm^2$$