X

Elite work–12 (Areas Related to Circles)

1) If the area of a circle is 154 cm^2, then its perimeter is
(a) 11cm (b) 22cm (c) 44cm (d) 55cm.

2) If θ is the angle (in degrees) of a sector of a circle of radius r, then area of the sector
(a) $\frac{\pi r^2\theta}{360^\circ}$ (b) $\frac{\pi r^2\theta}{180^\circ}$ (c) $\frac{2\pi r\theta}{360^\circ}$ (d) $\frac{2\pi r\theta}{180^\circ}$

3) If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R, then
(a) $R_1+R_2=R$ (b) $R_1^2+R_2^2=R^2$ (c) $R_1+R_2<R$ (d) $R_1^2+R_2^2<R^2$

4) If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R, then: (a) $R_1+R_2=R$ (b) $R_1+R_2>R$ (c) $R_1+R_2<R$ (d) nothing definite can be said about the relation among R_1, R_2 and R_3.

5) If the circumference of a circle and the perimeter of a square are equal, then
(a) area of the circle = area of the square
(b) area of the circle > area of the square
(c) area of the circle < area of the square
(d) nothing definite can be said about the relation between the areas of the circle and square.

6) Area of the largest $\triangle$ that can be inscribed in a semi-circle of radius r units is:
(a) r^2 sq. units (b) $\frac{1}{2}r^2$ sq. units (c) $2r^2$ sq. units (d) $\sqrt{2}r^2$ sq. units.

7) If the perimeter of a circle is equal to that of a square, then the ratio of their areas is:
(a) $\pi:2$ (b) $4:\pi$ (c) $1:2$ (d) $2:\pi$

8) It is proposed to build a single circular park equal in area to the sum of the areas of two circular parks of diameters 16m and 12m in a locality. The radius of the new park would be:
(a) 10m (b) 15m (c) 20m (d) 24m

9) The area of the circle that can be inscribed in a square of side 6cm is (a) $36\pi\ cm^2$ (b) $18\pi\ cm^2$ (c) $12\pi\ cm^2$ (d) $9\pi\ cm^2$

10) The area of the square that can be inscribed in a circle of radius 8cm is
(a) 256 cm^2 (b) 128 cm^2 (c) $64\sqrt{2}\ cm^2$ (d) 64 cm^2

X Elite work-12 (Areas Related to Circles – Answers)

1) $\pi R^2 = 154$

$\Rightarrow R^2 = \frac{154}{22} \times 7 = 49$

$\therefore R = \sqrt{49} = 7$ cm

Perimeter $= 2\pi R = 2 \times \frac{22}{7} \times 7 = 44$ cm (c)

2) Area of a sector $= \frac{\theta}{360^\circ} \times \pi r^2 = \frac{\pi r^2 \theta}{360^\circ}$ (a)

3) $\pi R_1^2 + \pi R_2^2 = \pi R^2$

$\Rightarrow \pi (R_1^2 + R_2^2) = \pi R^2$

$\therefore R_1^2 + R_2^2 = R^2$ (b)

4) $2\pi R_1 + 2\pi R_2 = 2\pi R$

$\Rightarrow 2\pi (R_1 + R_2) = 2\pi R$

$\therefore R_1 + R_2 = R$ (a)

5) $2\pi R = 4a$

$\Rightarrow R = \frac{4a}{2\pi} = \frac{2a}{\pi}$

area of a circle, $\pi R^2 = \pi \left(\frac{2a}{\pi}\right)^2 = \pi \times \frac{4a^2}{\pi^2} = \frac{4}{\pi}(a^2)$

$\therefore$ area of circle > area of the square (b)

6)

area $(\triangle ABC) = \frac{1}{2} \times OB \times AC$

$= \frac{1}{2} \times r \times 2r = r^2$ sq. units (a)

7) $2\pi r = 4a$

$\Rightarrow \frac{r}{a} = \frac{4}{2\pi} \Rightarrow \frac{r}{a} = \frac{2}{\pi}$

$\therefore$ ratio of their areas $= \frac{\pi r^2}{a^2} = \pi \left(\frac{r}{a}\right)^2 = \pi \times \frac{4}{\pi^2} = \frac{4}{\pi}$

Thus, the required ratio is $4 : \pi$ (b)

8) $r_1 = \frac{16}{2} = 8$ m ; $r_2 = \frac{12}{2} = 6$ m

Let R be the radius of new park

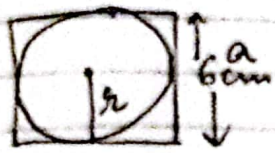
$\pi r_1^2 + \pi r_2^2 = \pi R^2$

$\Rightarrow r_1^2 + r_2^2 = R^2$

$\Rightarrow R^2 = 8^2 + 6^2 = 84 + 36 = 100$

$\therefore R = 10m$ (a)

9)



$r = \frac{a}{2} = 3cm$

area of circle $= \pi r^2 = 9\pi cm^2$ (d)

10)

$AC = \sqrt{2}a$

diagonal of a square $= \sqrt{2}a = 2r$

$\Rightarrow a = \frac{2r}{\sqrt{2}} = \sqrt{2}r\ cm$

$\therefore$ area of Square

$= a^2$

$= (\sqrt{2}r)^2 = 2r^2 = 2 \times 8^2 = 2 \times 64 = 128cm^2$ (b)
