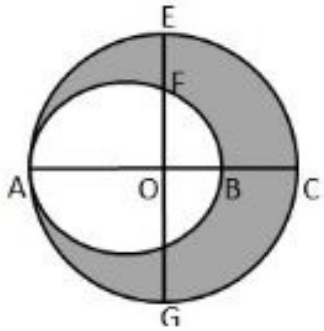
Question 17:



Diameter of bigger circle = AC = 54 cm

Radius of bigger circle = $\frac{AC}{2}$

$= \left(\frac{54}{2}\right) cm$

$= 27\ cm$

Diameter AB of smaller circle

$= AC - BC$

$= (54 - 10)\,cm = 44\,cm$

Radius of smaller circle = $\frac{44}{2} cm = 22\,cm$

Area of bigger circle = $\pi R^2 = \left(\frac{22}{7} \times 27 \times 27\right) cm^2$

$= 2291.14\ cm^2$

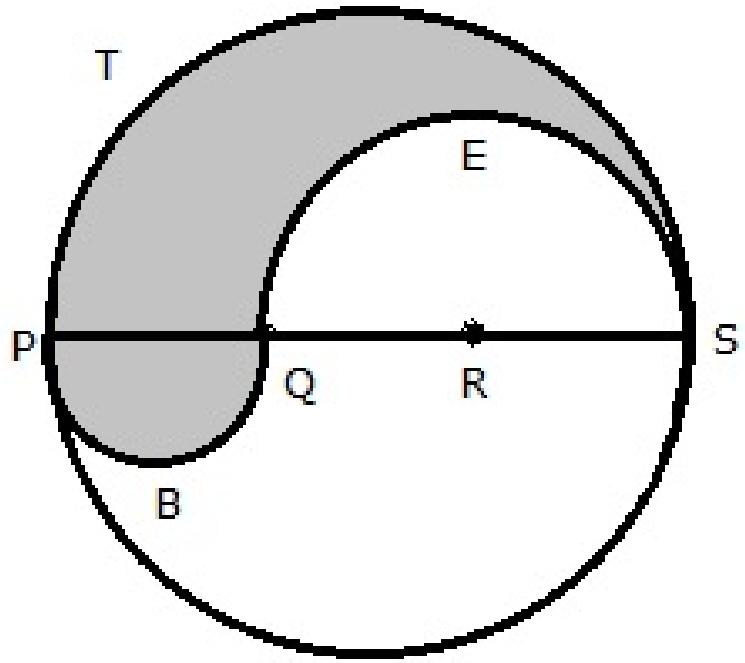
Area of smaller circle = $\pi r^2 = \left(\frac{22}{7} \times 22 \times 22\right) cm^2$

$= 1521.11\ cm^2$

Area of shaded region = area of bigger circle - area of smaller circle

= (2291. 14 - 1521. 11) cm^2 = 770 cm^2

Question 18:



PS = 12 cm
PQ = QR = RS = 4 cm, QS = 8 cm
Perimeter = arc PTS + arc PBQ + arc QES

$$= (\pi \times 6 + \pi \times 2 + \pi \times 4)\text{cm}$$

$$= 12\pi \text{ cm}$$

$$= 12\pi = 12 \times 3.14 \text{ cm}$$

$$= 37.68 \text{ cm}$$

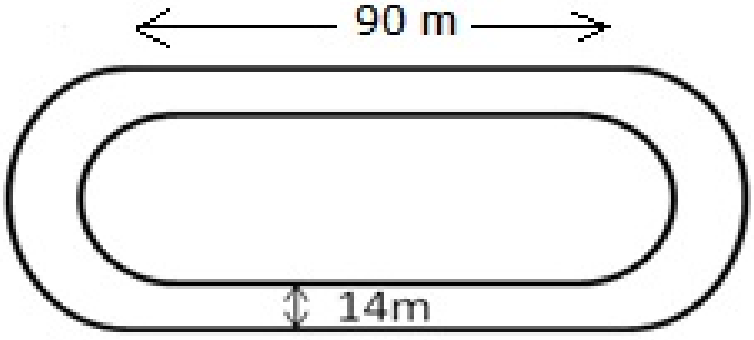
Area of shaded region = (area of the semicircle PBQ) + (area of semicircle PTS)-(Area of semicircle QES)

$$= \left[\frac{1}{2}\pi \times (2)^2 + \frac{1}{2} \times \pi \times (6)^2 - \frac{1}{2} \times \pi \times (4)^2\right]\text{cm}^2$$

$$= \left[2\pi + 18\pi - 8\pi\right] = 12\pi \text{ cm}^2 = (12 \times 3.14)\text{cm}^2$$

$$= 37.68 \text{ cm}^2$$

Question 19:



Length of the inner curved portion
= (400 - 2 × 90) m
= 220 m
Let the radius of each inner curved part be r

Then, $\frac{22}{7} \times r = 110 \text{ m}$

$$r = \left(110 \times \frac{7}{22}\right)\text{m} = 35 \text{ m}$$

Inner radius = 35 m, outer radius = (35 + 14) = 49 m
Area of the track = (area of 2 rectangles each 90 m × 14 m) + (area of circular ring with R = 49 m, r = 35 m

$$= \left[2 \times 90 \times 14 + \frac{22}{7}\left\{(49)^2 - (35)^2\right\}\right]\text{m}^2$$

$$= \left[2520 + \frac{22}{7}(49 + 35)(49 - 35)\right]\text{m}^2$$

$$= [2520 + 3696]\text{m}^2 = 6216 \text{ m}^2$$

Length of outer boundary of the track

$$= \left[2 \times 90 + 2 \times \frac{22}{7} \times 49\right]\text{m} = 488 \text{ m}$$

********** END **********