Previous Year Questions 2024

Q1: Perimeter of a sector of a circle whose central angle is 90° and radius 7 cm is:

(CBSE 2024)

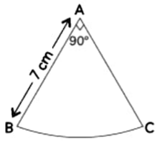
(a) 35 cm

(b) 11 cm

(c) 22 cm

(d) 25 cm

Ans: (d)

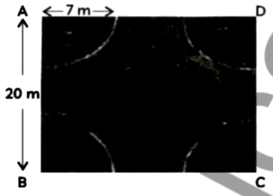


Perimeter of sector $= 2r + \frac{2\pi r\theta}{360°}$

$= 2 \times 7 + \frac{22}{7} \times 7 \times \frac{90°}{180°}$

$= 14 + 11 = 25$ cm

Q2: A stable owner has four horses. He usually ties these horses with 7 m long rope to pegs at each corner of a square-shaped grass field of 20 m length, to graze in his farm. But tying with rope sometimes results in injuries to his horses, so he decided to build a fence around the area so that each horse can graze. (CBSE 2024)



Based on the above, answer the following questions:

(A) Find the area of the square-shaped grass field.

(B) Find the area of the total field in which these horses can graze.

OR

If the length of the rope of each horse is increased from 7 m to 10 m, find the area grazed by one horse.

(Use π = 3.14)

(C) What is area of the field that is left ungrazed, if the length of the rope of each horse is 7 m?

Ans:

(A) Area of square shaped field

= 20 × 20

= 400 sq. m.

(B) Area of 4 quadrant = area of a. circle of radius 7m = πr^2

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

$= 154\ m^2$

OR

New radius = 10 m

So, area grazed by one horse = $\frac{1}{4}$ (Area of circle with radius 10 m)

$= \frac{1}{4} \pi \times (10)^2$

$= \frac{3.14 \times 10 \times 10}{4}$

$= 78.5\ m^2$

(C) Area of ungrazed portion = Area of square field – Area of circle with radius 7 m

$= 20 \times 20 - \frac{22}{7} \times 7 \times 7$

$= 400 - 154$

$= 246\ m^2$

Previous Year Questions 2023

Q3: What is the area of a semi-circle of diameter 'd'? (CBSE 2023)

(a) $1/16\pi d^2$

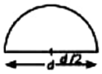
(b) $1/4\pi d^2$

(c) $1/8\pi d^2$

(d) $1/2\pi d^2$

Ans: (c)

Given diameter of semi circle = d

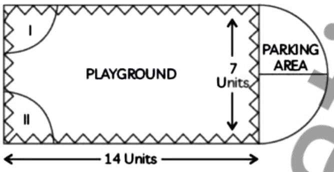


∴ Radius, r = d/2

Area of semi circle

$= \frac{1}{2}\pi\left(\frac{d}{2}\right)^2 = \frac{1}{2}\pi \times \frac{d^2}{4} = \frac{1}{8}\pi d^2$

Q4: Case Study: The Governing council of a local public development authority of Dehradun decided to build an adventurous playground on the top of a bill, which will have adequate space for parking.



After the survey, it was decided to build a rectangular playground, with a semi-circular area allotted for parking at one end of the playground. The length and breadth of the rectangular playground are 14 units and 7 units, respectively. There are two quadrants of radius 2 units on one side for special seats. Based on the above information, answer the following questions:

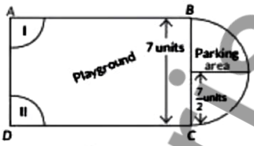
(i) What is the total perimeter of the parking area?

(ii) What is the total area of parking and the two quadrants? (CBSE 2023)

Ans: (i) Length of play ground . AB = 14 units, Breadth of play ground. AD = 7 units

Radius of semi - circular part is 7/2 units

Total perimeter of parking area = $\pi r + 2r$



$= \frac{22}{7} \times \frac{7}{2} + 2 \times \frac{7}{2}$

= 11 + 7 = 18 Units

(ii) (a): Area of parking = $\pi r^2 / 2$

$= \frac{1}{2} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2}$

= 19.25 sq. units

Area of two quadrants (I) a n d [II) =1/2 x 1/4 x πr^2

$= \frac{1}{2} \times \frac{22}{7} \times 2 \times 2$

= 6.29 sq. units

Total area of parking and two quadrant

= 19.25 + 6.29

= 25.54 sq. units

Q5: A chord of a circle of radius 14 cm subtends an angle of 60° at the centre. Find the area of the corresponding minor segment of the circle. Also, find the area of the major segment of the circle. (2023)

Ans: Here, radius t(r) = 14 cm and Sector angle (θ) = 60°

∴ Area of the sector

$$=\frac{\theta}{360°}\times\pi r^2=\left(\frac{60°}{360°}\times\frac{22}{7}\times14\times14\right)cm^2$$

= 102.67 cm^2

Since ∠O = 60° and OA = OB = 14 cm

∴ AOB is an equilateral triangle.

⇒ AS = 14 cm and ∠A = 60°

Draw OM ⊥ AB.

In ΔAMO

$$\frac{OM}{OA}=\sin60°=\frac{\sqrt{3}}{2}\Rightarrow OM=OA\times\frac{\sqrt{3}}{2}=\frac{14\sqrt{3}}{2}cm=7\sqrt{3}\ cm$$

Now,

$$ar(\Delta AOB)=\frac{1}{2}\times AB\times OM$$

$$=\frac{1}{2}\times14\times7\sqrt{3}\,cm^2=49\sqrt{3}\,cm^2$$

$$=49\times1.732\,cm^2=84.87\,cm^2$$

Now, area of the minor segment= (Area of minor sector) - (ar ΔAOB)

= 102.67 - 84.87 cm^2

= 17.8 cm^2

Area of the major segment

= Area of the circle - Area of the minor segment

$$=(\pi r^2-17.8)$$

$$=\left[\left(\frac{22}{7}\times14\times14\right)-17.8\right]cm^2$$

= (616 - 17.8) cm^2 = 598.2 cm^2

Previous Year Questions 2022

Q6: The area swept by 7 cm long minute band of a clock in 10 minutes is (CBSE 2022)

(a) 77 cm^2

(b) $12\frac{5}{6}cm^2$

(c) $7\frac{1}{12}cm^2$

(d) $25\frac{2}{3}cm^2$

Ans: (d)

Angle formed by minute hand of a clock in 60 minutes = 360°

∴ Angle formed by minute hand of a clock in 10 minutes = 10/60 x 360° = 60°

Length of minute hand of a dock = radius = 7 cm

∴ Required area

$$=\pi r^2\times\frac{\theta}{360°}=\frac{22}{7}\times7\times7\times\frac{60°}{360°}=\frac{77}{3}cm^2$$

$$=25\frac{2}{3}cm^2$$

Q7: Given below is the picture of the Olympic rings made by taking five congruent circles of radius 1 cm each, intersecting in such a way that the chord formed by joining the point of intersection of two circles is also of length 1 cm. The total area of all the dotted regions assuming the thickness of the rings to be negligible is

(2022)

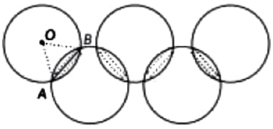
(a) $4\left(\frac{\pi}{12}-\frac{\sqrt{3}}{4}\right)cm^2$

(b) $\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)cm^2$

(c) $4\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)cm^2$

(d) $8\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)cm^2$

Ans: (d)



Let O be the centre of the circle. So. OA = OB = AB = 1 cm

So ΔOAB is an equilateral triangle.

$\therefore \angle AOB = 60°$

$\therefore$ Required area = 8 x area of one segment with r = 1 cm,θ = 60°

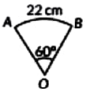
= 8 x (area of sector - area of ΔAOB)

$$=8\times\left(\frac{60°}{360°}\times\pi\times1^2-\frac{\sqrt{3}}{4}\times1^2\right)=8\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)cm^2$$

Previous Year Questions 2020

Q8: A piece of wire 22 cm long is bent into the form of an arc of a circle subtending an angle of 60° at its centre. Find the radius of the circle. [Use π = 22/7] (2020)

Ans: Let AB be the wire of length 22 cm in the form of an art of a circle so blending an $\angle AOB$ - 60° at centre O.



$\because$ Length of arc = $2\pi r\left(\frac{\theta}{360°}\right)$

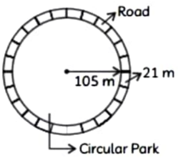
$$\Rightarrow \quad 22=2\times\frac{22}{7}\times r\left(\frac{60°}{360°}\right)\Rightarrow r=\frac{7\times6}{2}$$

= 21 cm

Hence, radius of the circle is 21cm.

Q9: A circular park is surrounded by a road 21 m wide. If the radius of the park is 105 m, find the area of the road. (CBSE 2020)

Ans:



Given: Width of road = 21 m

Radius of park, r_1 = 105 m

$\Rightarrow$ Radius of the whole circular portion (park + road)

r_2 = 105 + 21 = 126 m

So, Area of road = Area of park and road – Area of park

$= \pi r_2^2 - \pi r_1^2$

$= \pi(r_2^2 - r_1^2)$

$= \frac{22}{7}[(126)^2 - (105)^2]$

$= \frac{22}{7} \times (126 + 105)(126 - 105)$

$[\because a^2 - b^2 = (a + b)(a - b)]$

$= \frac{22}{7} \times 231 \times 21 = 15246$

Hence, the area of the road is 15246 m^2.

Previous Year Questions 2019

Q10: A car has two wipers which do not overlap. Each wiper has a blade of length 21 cm sweeping through an angle 120°. Find the total area cleaned at each sweep of the blades. (Take π = 22/7) (2019)

Ans: Here radius (r) = 21 cm

Sector angle (θ) = 120°

∴ Area cleaned by each sweep of the blades

$= \left[\frac{\theta}{360°} \times \pi r^2\right] \times 2$ [∵ there are 2 blades]

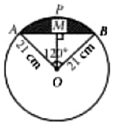
$= \left[\frac{120°}{360°} \times \frac{22}{7} \times 21 \times 21\right] \times 2$

$= 22 \times 7 \times 3 \times 2 \text{ cm}^2$

$= 924 \text{ cm}^2$

Q11: Find the area of the segment shown in the given figure, if radius of the circle is 21 cm and ∠AOB = 120°. (Take π = 22/7) (2019)

Ans:



In ΔAOM and ΔBOM,

∠AMO = ∠BMO (by construction)

AO = BO (radius of the same circle)

OM = OM (common side)

∴ ΔAOM ≅ Δ BOM (By RHS congruence rule)

We have , ∠AMO = ∠BMO = 60° (By CPCT) ....(i)

AM = BM (By CPCT) ....(ii)

In ΔAOM,

$\sin 60° = \frac{AM}{OA} = \frac{AM}{21}$

$\Rightarrow \frac{AM}{21} = \frac{\sqrt{3}}{2}$

$\Rightarrow AM = \frac{21\sqrt{3}}{2} \text{cm}$

Also, $\cos 60° = \frac{OM}{OA}$

$\Rightarrow \frac{OM}{OA} = \frac{1}{2}$

$\Rightarrow \frac{OM}{OA} = \frac{21}{2} \text{cm}$

$AB = AM + MB = 2AM = 21\sqrt{3} \text{cm}$ ....[from (ii)]

Area of sector AOB $= \frac{120}{360} \cdot \pi r^2 = \frac{1}{3} \cdot \frac{22}{7} \cdot 21^2 = 462 \text{cm}^2$

Area of ΔAOB $= \frac{1}{2} \times OM \times AB = \frac{1}{2} \times \frac{21}{2} \times 21\sqrt{3} = \frac{444\sqrt{3}}{4} \text{cm}^2 \approx 191 \text{cm}^2$

Required area of segment = Area of sector AOB -">– Area of ΔAOB

$= 462 - 191 = 271 \text{ cm}^2$ (approx.)

Q12: In the given figure, three sectors of a circle of radius 7 cm, making angles of 60°, 80° and 40° at the centre are shaded. Find the area of the shaded region. (2019)

Ans: Radius (r) of circle = 7 cm

Area of shaded region =

$\frac{\pi(7)^2\cdot 40^\circ}{360^\circ}+\frac{\pi(7)^2\cdot 60^\circ}{360^\circ}+\frac{\pi(7)^2\cdot 80^\circ}{360^\circ}$ [$\because$ Area of sector $= \frac{\theta}{360^\circ}\pi r^2$]

$= \frac{\pi(7)^2}{9}+\frac{\pi(7)^2}{6}+\frac{\pi(7)^2\cdot 2}{9} = \pi(7)^2\left[\frac{1}{9}+\frac{1}{6}+\frac{2}{9}\right]$

$= \frac{22}{7}\times 7\times 7\times\frac{9}{18}$:

$= 77\ cm^2$

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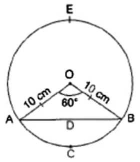
Previous Year Questions 2017

Q13: A chord PQ of a circle of radius 10 cm subtends an angle of 60° at the centre of the circle. Find the area of major and minor segments of the circle. (Delhi 2017)

Ans: Radius of the circle = 10 cm

Central angle subtended by chord AB = 60°

Area of minor sector OACB



Area of equilateral triangle OAB formed by radii and chord

$= \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4}\times(10)^2 = \frac{1.732}{4}\times 100 = 43.3\ cm^2$

∴ Area of minor segment ACBD

= Area of sector OACB - Area of triangle OAB

$= (52.38 - 43.30)\ cm^2 = 9.08\ cm^2$

Area of circle $= \pi r^2$

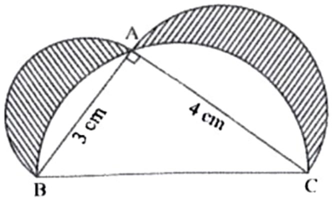
$= \frac{22}{7}\times(10)^2 = \frac{22\times 100}{7} = 314.28\ cm^2$

∴ Area of major segment ADBE

= Area circle - Area of minor segment

$= (314.28 - 9.08)\ cm^2 = 305.20\ cm^2$

Q14: In the given figure, ΔABC is a right-angled triangle in which ∠A is 90°. Semi circles are drawn on AB, AC and BC as diameters. Find the area of the shaded region. (AI 2017)



Ans: In right triangle ABC.

$AB^2 + AC^2 = BC^2$

$\Rightarrow (3)^2 + (4)^2 = BC^2 \Rightarrow 9 + 16 = BC^2 \Rightarrow 25 = BC^2$

$\therefore BC = 5$ cm

Now, Area of shaded region = Area of semicircle on side AB + area of semicircle on side AC - area of semicircle on side BC + area of ΔABC

Now, Area o f semicircle on side AB $AB = \frac{1}{2}(\pi r^2)$

$= \frac{1}{2} \times \frac{22}{7} \times \left(\frac{3}{2}\right)^2 \text{ cm}^2 = \frac{11}{7} \times \frac{9}{4} = \frac{99}{28} \text{ cm}^2$ ...(i)

Area of semicircle on side AC $= \frac{1}{2}(\pi r^2)$

$= \frac{1}{2} \times \frac{22}{7} \times (2)^2 = \frac{11}{4} \times 4 = \frac{44}{7} \text{ cm}^2$ ...(ii)

Area of semicircle on side BC $= \frac{1}{2}(\pi r^2)$

$= \frac{1}{2} \times \frac{22}{7} \times \left(\frac{5}{2}\right)^2 \text{ cm}^2$

$= \frac{11}{7} \times \frac{25}{4} \text{ cm}^2 = \frac{275}{28} \text{ cm}^2$ ...(iii)

Area of ΔABC $= \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$ ...(iv)

$\therefore$ Area of shared region = (i) + (ii) − (iii) + (iv)

$= \frac{99}{28} + \frac{44}{7} - \frac{275}{28} + 6 = \frac{99}{28} + \frac{176}{28} - \frac{275}{28} + \frac{168}{28}$

$= \frac{168}{28} \text{ cm}^2$

Hence area of the shaded region = 6 cm^2

Q15: In the following figure, O is the centre of the circle with AC = 24 cm , AB = 7 cm and ∠BOD = 90°. Find the area of the shaded region. (CBSE (AI) 2017)

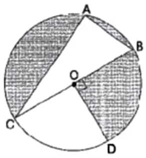


Fig. 12.51

Ans: In right angle triangle ABC

Diameter $BC = \sqrt{24^2 + 7^2} = 25$ cm

Area $\Delta CAB = \frac{1}{2} \times \text{base} \times \text{height}$

$= \frac{1}{2} \times 24 \times 7 = 84 \text{ cm}^2$

Area of shaded region = area of semicircle - area of ΔCAB + area of quadrant BOD

$= \frac{\pi}{2}\left(\frac{25}{2}\right)^2 - 84 + \frac{\pi}{4}\left(\frac{25}{2}\right)^2$

$= \left(\frac{625\pi}{8} + \frac{625\pi}{16}\right) - 84$

$= \left(\frac{1875\pi}{16} - 84\right) = (117.18\pi - 84) = 283.94 \text{ cm}^2$

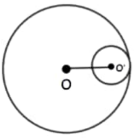
Q16: Two circles touch internally. The sum of their areas is 116π cm^2 and the distance between their centres is 6 cm. Find the radii of the circles. (CBSE 2017)

Ans: Let 'r' and 'R' be the radii of the smaller and bigger circles, respectively.

Then, OO' = R – r = 6 cm [Given] ...(i)

Also, sum of their areas = 116π cm^2

i.e., $\pi R^2 + \pi r^2 = 116\pi$



$\Rightarrow R^2 + r^2 = 116$ ...(ii)

We know, $(R - r)^2 = R^2 + r^2 - 2Rr$

$\Rightarrow (6)^2 = 116 - 2Rr$

$\Rightarrow 2Rr = 116 - 36 = 80$

$\Rightarrow Rr = 40$ ...(iii)

Also, $(R + r)^2 = R^2 + r^2 + 2Rr = 116 + 2 \times 40$ [Using (ii) and (iii)]

$\Rightarrow (R + r)^2 = 196$

$\Rightarrow R + r = 14$ ...(iv)

Now, adding equations (i) and (iv), we get

2R = 20

$\Rightarrow$ R = 10 cm

Putting the value of R in equation (i), we get

r = 4 cm

Hence, the radii of the bigger and smaller circles are 10 cm and 4 cm, respectively.

Previous Year Questions 2016

Q17: In Fig. 12.34, O is the centre of a circle such that diameter AB =13 cm and AC = 12 cm. BC is joined. Find the area of the shaded region. (Take k = 3.14) (CBSE (AI) 2016)

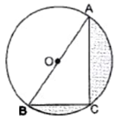


Fig. 12.34

Ans: In ΔABC, ∠ACB = 90° (Angle in the semicircle)

$\therefore BC^2 + AC^2 = AB^2$

$\therefore BC^2 = AB^2 - AC^2$

= 169 - 144 = 25

∴ BC = 5 cm

Area of the shaded region = area of semicircle - area of right AABC

$= \frac{1}{2}\pi r^2 - \frac{1}{2} \times BC \times AC$

$= \frac{1}{2}(3.14)\left(\frac{13}{2}\right)^2 - \frac{1}{2} \times 5 \times 12$

$= 66.33 - 30 = 36.33 \text{ cm}^2$

Q18: In the given figure, are shown two arcs PAQ and PBQ. Arc PAQ is a part of the circle with centre 0 and radius OP while arc PBQ is a semi-circle drawn on PQ as diameter with centre M.

If OP = PQ = 10 cm show that the area of the shaded region is 25 $\left(\sqrt{3} - \frac{\pi}{6}\right)$cm². (CBSE (Delhi) 2016)

Ans: Since OP = PQ = QO

$\Rightarrow$ APOQ is an equilateral triangle

∴ ∠POQ = 60°

Area of segment PAQM

$= \frac{\theta}{360°}\pi r^2 - \frac{\sqrt{3}}{4}a^2 = \frac{60°}{360°}\pi \times 10^2 - \frac{\sqrt{3}}{4} \times 10^2$

$= \left(\frac{100\pi}{6} - \frac{100\sqrt{3}}{4}\right)\text{cm}^2$

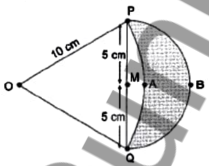


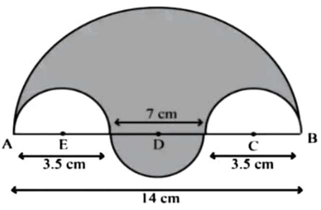
Fig. 12.35

Area of semicircle with M as centre $= \frac{\pi}{2}(5)^2 = \frac{25\pi}{2}\text{ cm}^2$

Area of shaded region $= \frac{25\pi}{2} - \left(\frac{50\pi}{3} - 25\sqrt{3}\right) = \frac{25}{2}\pi - \frac{50}{3}\pi + 25\sqrt{3}$

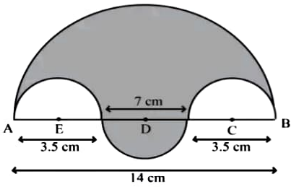
$= \frac{-25}{6}\pi + 25\sqrt{3} = 25\left(\sqrt{3} - \frac{\pi}{6}\right)\text{cm}^2$

Q19: In the figure, the boundary of the shaded region consists of four semicircular arcs, two smallest being equal. If the diameter of the largest is 14 cm and that of the smallest is 3.5 cm, calculate the area of the shaded region. region. $\left[\text{Use } \pi = \frac{22}{7}\right]$ **(Foreign**



Ans: Given AD = 14 cm, AB = CD = 3.5 cm

∴ BC = 7 cm



Area of shaded region

$= \left[\frac{1}{2}\pi(7)^2 + \frac{1}{2}\pi\left(\frac{7}{2}\right)^2 - 2\times\frac{1}{2}\pi\left(\frac{7}{4}\right)^2\right]$ sq. cm

$= \frac{1}{2}\pi\left[49 + \frac{49}{4} - \frac{49}{8}\right]$ sq. cm

$= \frac{1}{2}\times\frac{22}{7}\left[49 + \frac{49}{8}\right]$ sq. cm $= \frac{1}{2}\times\frac{22}{7}\times 49\times\frac{9}{8}$ sq. cm

$= 86.63$ sq. cm

Q20: Find the area of the shaded region in Fig. 12.23, where a circular arc of radius 6 cm has been drawn with vertex 0 of an equilateral triangle ΔOAB of side 12 cm as the centre. (NCERT, CBSE (F) 2016)

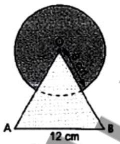


Fig. 12.23

Ans: We have, radius of circular region = 6 cm and each side of ΔOAB = 12 cm.

∴ Area of the circular portion

= area of circle - area of the sector

$= \pi r^2 - \frac{\theta}{360°}\times\pi r^2$

$= \pi r^2\left(1 - \frac{\theta}{360°}\right) = \frac{22}{7}\times(6)^2\left(1 - \frac{60°}{360°}\right)$

$= \frac{22}{7}\times 36\times\frac{5}{6} = \frac{22\times 30}{7} = \frac{660}{7}\ cm^2$

Now, area of the equilateral triangle OAB

$= \frac{\sqrt{3}}{4}\times(\text{side})^2 = \frac{\sqrt{3}}{4}\times(12)^2 = \frac{\sqrt{3}}{4}\times 144 = 36\sqrt{3}\ cm^2$

∴ Area of shaded region = area of circular portion + area of equilateral triangle OAB

$= \left(\frac{660}{7} + 36\sqrt{3}\right)cm^2 = \frac{12}{7}(55 + 21\sqrt{3})\ cm^2$

Q21: An elastic belt is placed around the rim of a pulley of radius 5 cm. (Fig. 12.46). From one point C on the belt, the elastic belt is pulled directly away from the centre O of the pulley until it is at P, 10 cm from the point O. Find the length of the belt that is still in contact with the pulley. Also, find the shaded area. (Use π = 3.14 and √3 = 1.73) (CBSE Delhi 2016)

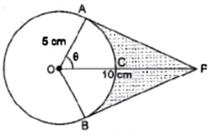


Fig. 12.46

Ans: In ΔAOP, $\cos\theta = \frac{5}{10}$

$\Rightarrow \cos\theta = \frac{1}{2} \Rightarrow \theta = 60°$

$\Rightarrow$ Reflex $\angle AOB = 240°$

$\therefore$ Length of belt in contact with pully $= \frac{\theta}{360°} \times 2\pi r$

$= \frac{2 \times 3.14 \times 5 \times 240}{360} = 20.93$ cm

Now, $\frac{AP}{OA} = \tan 60°$

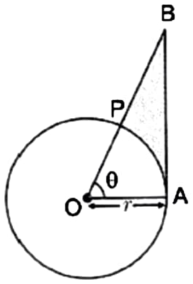
PA = 5√S cm = BP (Tangents from an external point are equal)

Area $(\Delta OAP + \Delta OBP) = 2\left(\frac{1}{2} \times 5 \times 5\sqrt{3}\right) = 25\sqrt{3} = 43.25$ cm^2

Area of sector $OACB = \frac{\theta}{360°}\pi r^2 = \frac{25 \times 3.14 \times 120}{360} = 26.17$ cm^2

Shaded area = 43 .25 - 26 .17 = 17.08 cm^2

Q22: In the figure given, a sector OAP of a circle with centre O, containing angle 0. AB is perpendicular to the radius OA and meets OP produced at B. Prove that the perimeter of the shaded region is $r\left[\tan\theta + \sec\theta + \frac{\pi\theta}{180°} - 1\right]$. (CBSE (AI) 2016)



Ans: Length of arc $\widehat{AP} = 2\pi r \frac{\theta}{360°}$ or $\frac{\pi r\theta}{180°}$

In right ΔAOB

$\frac{AB}{r} = \tan\theta \Rightarrow AB = r\tan\theta$

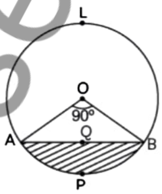
$\frac{OB}{r} = \sec\theta \Rightarrow OB = r\sec\theta$ 6

$PB = OB - OP = r\sec\theta - r$

Perimeter of shaded region $= AB + PB + \widehat{AP} = r\tan\theta + r\sec\theta - r + \frac{\pi r\theta}{180°}$

$= r\left[\tan\theta + \sec\theta - 1 + \frac{\pi\theta}{180°}\right]$ Hence proved.

Q23: In the figure, AB is a chord of a circle with a centre O and a radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment AQBP. Also, find the area of the major segment ALBQA. (Use π = 3.14) (CBSE 2016)



Ans: Given, A circle of radius (r) = 10 cm in which ∠AOB = 90°.

Area of the minor segment AQBP = Area of sector OAPB – Area of ΔAOB

= θ / 360° × πr^2 – 1 /2 × OA × OB

= 90 / 360 ° × 3.14 × 10 × 10 – 1/ 2 × 10 × 10

= 3.14 × 5 × 5 – 5 × 10

= 78.5 – 50

= 28.5 cm^2

So, Area of the minor segment AQBP = 28.5 cm^2

Area of the major segment ALBQA = Area of circle – Area of minor segment AQBP

= 3.14 × (10)^2 – 28.5

= 314 – 28.5

= 285.5 cm^2