

Nayak's Tutorials

Year : 2025 - 26
Std : X SSC

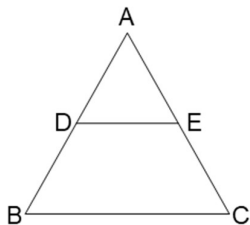
Sample Paper 3
Geometry

Marks : 40
Duration : 2 hr

Q.1 A) Solve Multiple choice questions.

(4)

- 1) In fig, seg DE || seg BC, identify correct statement.



(a) $\frac{AD}{DB} = \frac{AE}{AC}$

(b) $\frac{AD}{DB} = \frac{AB}{AC}$

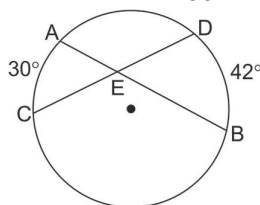
(c) $\frac{AD}{DB} = \frac{EC}{AC}$

(d) $\frac{AD}{DB} = \frac{AE}{EC}$

2)

From the information given in the figure, find the measure of $\angle AEC$.

- a. 42° b. 30° c. 36° d. 72°



- 3) Find the co-ordinates of point which divides the point (8, 9) and (-7, 4) in the ratio 2:3 internally.

- a. (3, 5) b. (2, 7) c. (1, 3) d. (3, 4)

- 4) What will be the total surface area and volume of a sphere of radius 6 cm?

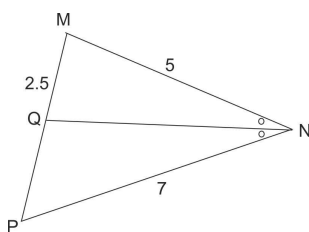
- (a) 524.16 cm^2 and 409.32 cm^3
(b) 245.16 cm^2 and 94.32 cm^3
(c) 452.16 cm^2 and 904.32 cm^3
(d) 254.16 cm^2 and 90.32 cm^3

B) Solve the following questions.

(4)

- 1) Find the diagonal of a rectangle whose length is 35 cm and breadth is 12 cm.

- 2) In $\triangle MNP$, NQ is a bisector of $\angle N$. If $MN = 5$, $PN = 7$, $MQ = 2.5$ then find QP.



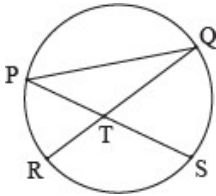
- 3) Angles made by the line with the positive direction of X-axis are given. Find the slope of these lines.
 60°
- 4) Find the angle subtended at the centre of a circle by an arc of length 6.05 m, if the radius of the circle is 5.5 m.

Q.2 A) Complete the following Activities. (Any two)

(4)

- 1) In the figure if the chord PQ and chord RS intersect at point T Prove that:

$m\angle STQ = \frac{1}{2} [m(\text{arc PR}) + m(\text{arc SQ})]$ for any measure of $\angle STQ$ by filling out the boxes.



$$m\angle STQ = m\angle SPQ + \underline{\hspace{2cm}} \dots \text{(Theorem of the external angle of a triangle)}$$

$$m\angle STQ = \frac{1}{2} m(\text{arc SQ}) + \underline{\hspace{2cm}}$$

$$m\angle STQ = \frac{1}{2} \underline{\hspace{2cm}}$$

- 2) A washing tub in the shape of a frustum of a cone has height 21cm. The radii of the circular top and bottom are 20cm and 15cm respectively. What is the capacity of the tub? ($\pi = \frac{22}{7}$)

$$\text{Volume of washing tub} = \frac{1}{3} \times \pi h (\underline{\hspace{2cm}})$$

$$= \frac{1}{3} \times \frac{22}{7} \times 21 (20^2 + 15^2 + 20 \times 15)$$

$$= 22 (\underline{\hspace{2cm}})$$

$$= 22 \times \underline{\hspace{2cm}}$$

$$\text{Volume of washing tub} = \underline{\hspace{2cm}} \text{ cm}^3$$

$$\therefore \text{Capacity of washing tub is } \underline{\hspace{2cm}} \text{ cm}^3$$

- 3) Prove the following:

$$\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2 \sec^2\theta$$

Solution:

$$\text{LHS} = \frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta}$$

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

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

$$= \frac{2}{\cos^2 \theta}$$

$$\dots [\sin^2 \theta + \cos^2 \theta = 1]$$

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\therefore \text{LHS} = \text{RHS}$$

$$\frac{1}{1-\sin \theta} + \frac{1}{1+\sin \theta} = 2 \sec^2 \theta$$

B) Solve the following questions. (Any four)

(8)

- 1) Draw any circle. Take any point A on it and construct tangent at A without using the centre of the circle.
- 2) If radii of two circles are 4 cm and 2.8 cm. Draw figure of these circles touching each other -
(i) externally (ii) internally.
- 3) A person is standing at a distance of 80m from a church looking at its top. The angle of elevation is of 45° . Find the height of the church.
- 4) If the slope of the line joining points (k, - 3) and (4, 5) is $\frac{1}{2}$, then find the value of k.
- 5) Prove that : In a triangle if the square of one side is equal to the sum of the squares of the remaining two sides, then the triangle is a right angled triangle.

Q.3 A) Complete the following activity. (Any one)

(3)

1)

Find the ratio in which the line segment joining the points A (3, 8) and B (−9, 3) is divided by the Y- axis.

Let, A $\equiv$ (3, 8) $\equiv$ (x₁, y₁),

B $\equiv$ (− 9, 3) $\equiv$ (x₂, y₂)

Let, P (x, y) divides seg AB in the ratio m : n.

$\therefore$ By section formula,

$$x = \underline{\hspace{2cm}}$$

$$= \frac{m(-9) + n(3)}{m+n}$$

$$x = \underline{\hspace{2cm}}$$

As point P lies on Y axis, its x coordinate is .

$\therefore$

$$0 = \frac{-9m + 3n}{m+n}$$

$$\therefore 0 = \underline{\hspace{2cm}}$$

$$\therefore 9m = 3n$$

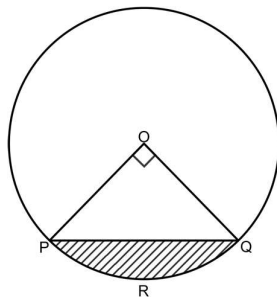
$$\therefore \frac{m}{n} = \underline{\hspace{2cm}}$$

$$\therefore \frac{m}{n} = \underline{\hspace{2cm}}$$

$\therefore$ Point P divides seg AB in the ratio 1 : 3

2)

In the figure, O is the centre of the circle. $\angle POQ = 90^\circ$. The area of the shaded region is 126 cm^2 . Find the radius of the circle.



$$\begin{aligned} \text{Area of the segment} &= \underline{\hspace{2cm}} - \text{Area of } \triangle POQ \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\therefore 126 = \underline{\hspace{2cm}} \quad \dots (\underline{\hspace{2cm}} = 1)$$

$$\therefore 126 = r^2 \left[\frac{11}{14} - \frac{1}{2} \right]$$

$$\therefore 126 = r^2 \left[\frac{11-7}{14} \right]$$

$$\therefore 126 = r^2 \left[\frac{4}{14} \right]$$

$$\begin{aligned} \therefore r^2 &= \frac{126 \times 14}{4} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

The radius of the circle is $\underline{\hspace{2cm}}$.

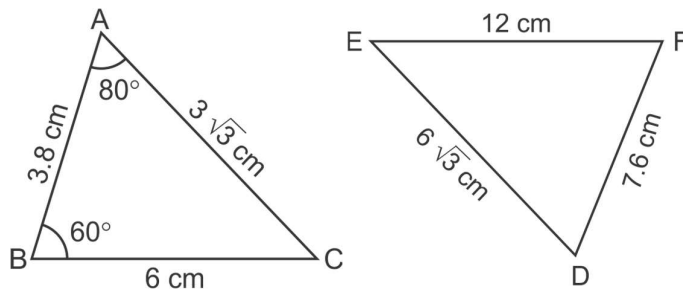
B) Solve the following questions. (Any two)

(6)

- 1) If point T divides the segment AB with A(- 7, 4) and B(- 6, - 5) in the ratio 7 : 2, find the co-ordinates of T.

2)

Using the information given in the adjoining figure find $\angle F$.



3)

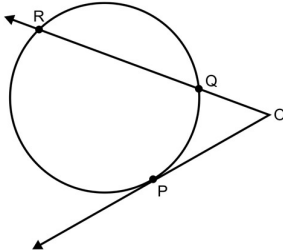
In $\triangle ABC$, $AB = 10$, $AC = 7$, $BC = 9$ then find the length of the median drawn from point C to side AB.

4) Draw a circle with centre O and radius 3.5 cm. Take point P at a distance 5.7 cm from the centre. Draw tangents to the circle from point P.

Q.4 Solve the following questions. (Any two)

(8)

1)



In the figure, P is the point of contact.

(1) If $m(\text{arc PR}) = 140^\circ$, $\angle POR = 36^\circ$, find $m(\text{arc PQ})$

(2) If $OP = 7.2$, $OQ = 3.2$, find OR and QR

(3) If $OP = 7.2$, $OR = 16.2$, find QR.

2)

$\triangle ABC \sim \triangle DEF$, In $\triangle ABC$, $AB = 5.2$ cm, $BC = 4.6$ cm. $\angle B = 45^\circ$ and $\frac{BC}{EF} = \frac{2}{3}$. Construct $\triangle DEF$.

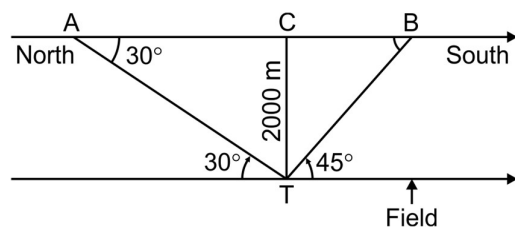
3) Prove the following.

$$(\sec A - \operatorname{cosec} A)(1 + \tan A + \cot A) = \tan A \sec A - \cot A \operatorname{cosec} A$$

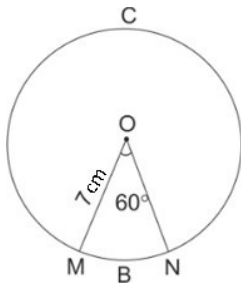
Q.5 Solve the following questions. (Any One)

(3)

1) Construct a trigonometry word problem (find speed) by looking at the figure . Solve the problem you have constructed.



2)



In the figure, radius of the circle is 7 cm and $m(\text{arc MBN}) = 60^\circ$, find

(1) Area of the circle .

(2) $A(\text{O} - \text{MBN})$.

(3) $A(\text{O} - \text{MCN})$.