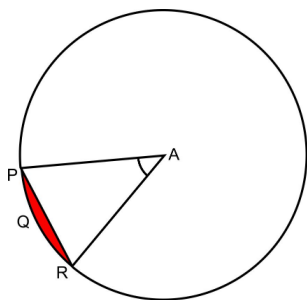




Mumbai

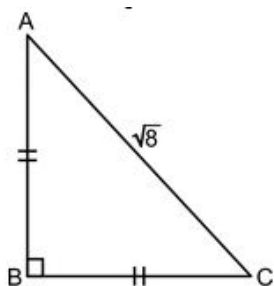




The radius of the circle (r) = $AP = 7.5$, $m(\text{arc } PQR) = \angle PAR = \theta = 30^\circ$

$$\begin{aligned}
 \text{Area of the segment } PQR &= r^2 \left(\frac{\pi\theta}{360} - \frac{\sin\theta}{2} \right) \\
 &= \left(\frac{15}{2} \right)^2 \left(\frac{\pi \times 30}{360} - \frac{\sin 30}{2} \right) \\
 &= \left(\frac{15}{2} \right)^2 \left(\frac{3.14}{12} - \frac{1}{4} \right) \\
 &= \frac{225}{4} \times \left(\frac{3.14}{12} - \frac{1}{4} \right) \\
 &= \frac{225 \times 0.14}{4 \times 12} \\
 &= \frac{225 \times 0.14}{48} \\
 &= 9.3 \times \frac{1}{10} \\
 &= 0.93 \text{ cm}^2
 \end{aligned}$$

(2) For finding AB and BC with the help of information given in figure, complete following activity.



$$AB = BC$$

... [converse of isosceles triangle theorem]

$$\therefore \angle BAC = \dots\dots\dots$$

$$\therefore AB = BC = \dots\dots\dots \times AC$$

... by $45^\circ - 45^\circ - 90^\circ$ triangles theorem

$$= \dots\dots\dots \times \sqrt{8}$$

$$= \dots\dots\dots \times 2\sqrt{2}$$

$$\therefore AB = BC = \dots\dots\dots$$

(3) Find the slopes of the lines passing through the given points.

$C(5, -2)$, $D(7, 3)$

Let $C \equiv (5, -2) \equiv (x_1, y_1)$ $D \equiv (7, 3) \equiv \dots\dots\dots$

$$\text{Slope of line } CD = \dots\dots\dots$$

$$= \dots\dots\dots$$

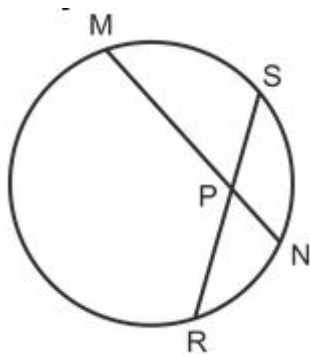
$$= \dots\dots\dots$$

$$\therefore \text{Slope of line } CD = \dots\dots\dots$$

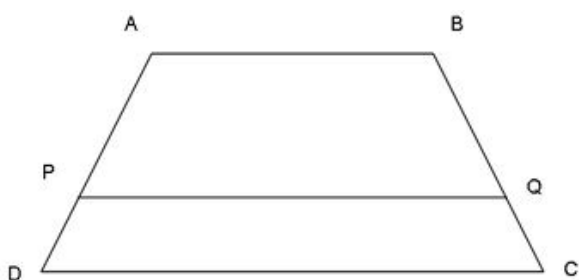
(B) Solve the following subquestions (any four) :

(8)

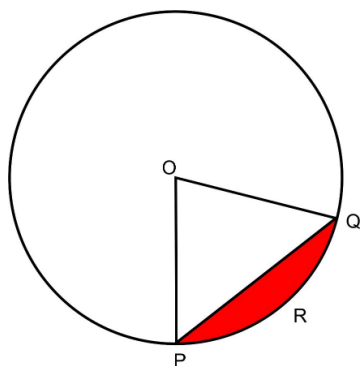
(1) In figure, chord MN and chord RS intersect each other at point P. If PR = 6, PS = 4, MN = 11, find PN.



(2) In trapezium ABCD, side AB \parallel side PQ \parallel side DC, AP = 15, PD = 12, QC = 14, find BQ.



(3) In the figure, if O is the centre of the circle, PQ is a chord. $\angle POQ = 90^\circ$, area of shaded region is 114 cm^2 , find the radius of the circle. ($\pi = 3.14$)



(4) Find k if the line passing through points P(-12, -3) and Q(4, k) has slope $\frac{1}{2}$.

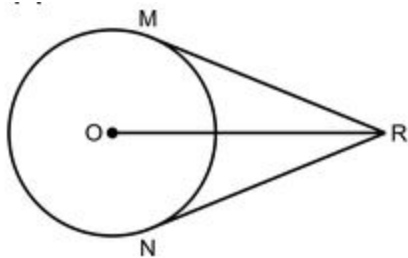
(5) Draw a circle of radius 2.7 cm. Draw a tangent to the circle at any point on it.

Q3(A) Complete the following activity and rewrite it (any one) :

(3)

(1) In the adjoining figure, O is the centre of the circle. From point R, seg RM and seg RN are tangent segments touching the circle at M and N. If OR = 10 cm and radius of the circle = 5 cm, then

- What is the length of each tangent segment ?
- What is the measure of $\angle MRO$?
- What is the measure of $\angle MRN$?



$$\angle OMR = 90^\circ$$

... (Radius perpendicular to tangent)

\therefore In $\triangle OMR$,

$$\dots\dots\dots = OR^2$$

... (Pythagoras theorem)

$$52 + MR^2 = 10^2$$

$$MR^2 = 100 - 25$$

$$MR^2 = 75$$

$$MR = \dots\dots\dots$$

... (.....)

In $\triangle OMR$,

$$OM = \dots\dots\dots$$

$$\therefore \angle ORM = \dots\dots\dots$$

... (since opposite side is half of hypotenuse)

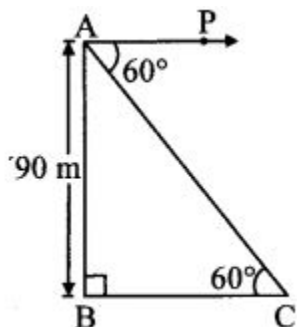
Similarly in $\triangle ONR$ we can show that,

$$\therefore \angle MRN = \dots\dots\dots$$

$$= 30^\circ + 30^\circ$$

$$= 60^\circ$$

- (2) From the top of a lighthouse, an observer looking at a ship makes an angle of depression of 60° . If the height of the lighthouse is 90 m then find how far is the ship from the lighthouse. ($\sqrt{3} = 1.73$)



Let AB be the light house.

The ship is at C and observer is at A.

$\angle MAC$ is the angle of depression.

$$\angle MAC = \angle ACB = \dots\dots\dots \text{...(Alternate angle)}$$

$$AB = \dots\dots\dots$$

$$\text{From the figure, } \tan 60^\circ = \dots\dots\dots$$

$$\sqrt{3} = \frac{90}{BC}$$

$$BC = \frac{90}{\sqrt{3}} = \dots\dots\dots = \frac{90\sqrt{3}}{3} = \dots\dots\dots$$

$$\therefore BC = 30 \times 1.73$$

\therefore The ship is at a distance of $\dots\dots\dots$ from the light house.

(B) Solve the following subquestions (any two) :

(6)

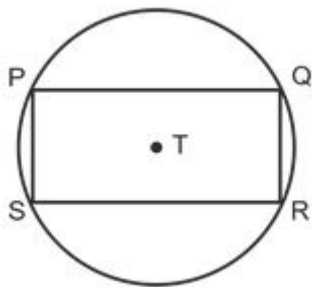
- (1) The ratio of the intercepts made on a transversal by three parallel lines is equal to the ratio of the corresponding intercepts made on any other transversal by the same parallel lines.

(2) $\triangle ABC$ is an equilateral triangle. Point P is on base BC such that $PC = \frac{1}{3} BC$, if $AB = 6$ cm find AP.

(3) In the figure, a rectangle PQRS is inscribed in a circle with centre T.

Prove that, (1) arc PQ \cong arc SR

(2) arc SPQ \cong PQR



(4) The radius and height of a cylindrical water reservoir is 2.8 m and 3.5 m respectively. How much maximum water can the tank hold ? A person needs 70 litre of water per day. For how many persons is the water sufficient for a day? ($\pi = \frac{22}{7}$)

Q4) Solve the following subquestions (any two) :

(8)

(1) Construct any $\triangle ABC$. Construct $\triangle A'BC'$ such that $AB : A'B = 5:3$ and $\triangle ABC \sim \triangle A'BC'$.

(2) Determine whether the points are collinear.

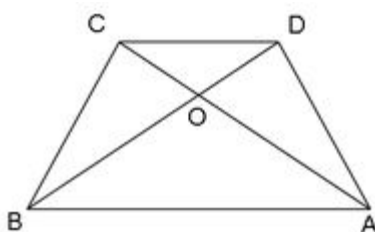
R (0, 3), D (2, 1), S (3, -1)

(3) Two buildings are facing each other on a road of width 12 metre. From the top of the first building, which is 10 metre high, the angle of elevation of the top of the second is found to be 60° . What is the height of the second building?

Q5) Solve the following subquestions (any one) :

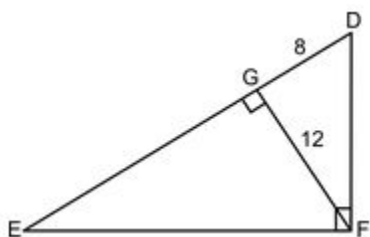
(3)

(1) In trapezium ABCD, side AB \parallel side DC, diagonals AC and BD intersect in point O. If $AB = 20$, $DC = 6$, $OB = 15$ then find OD.



(2) In figure, $\angle DFE = 90^\circ$, $FG \perp ED$, if $GD = 8$, $FG = 12$.

Find (1) EG (2) FD and (3) EF



All the Best