

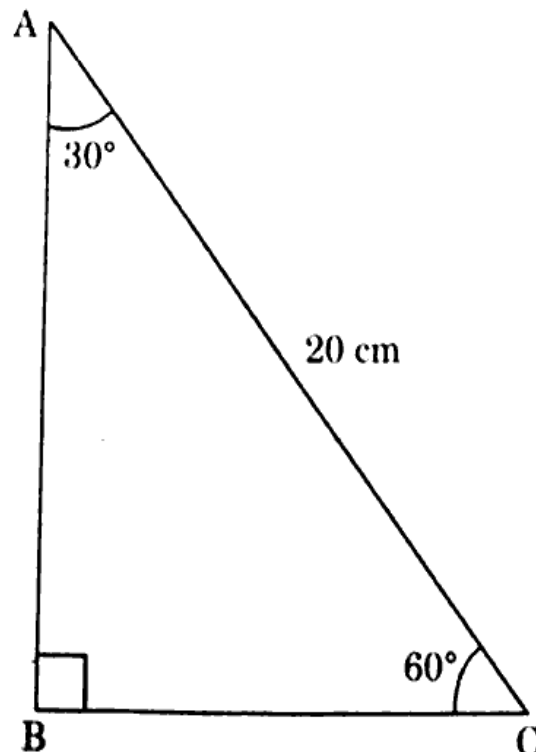
Note :—

- (i) Solve *all* questions. Draw diagrams wherever necessary.
- (ii) Use of calculator is not allowed.
- (iii) Figures to the right indicate full marks.
- (iv) Marks of constructions should be distinct. They should not be rubbed off.
- (v) Diagram is essential for the proof of the theorem.

1. Solve any *five* sub-questions :

5

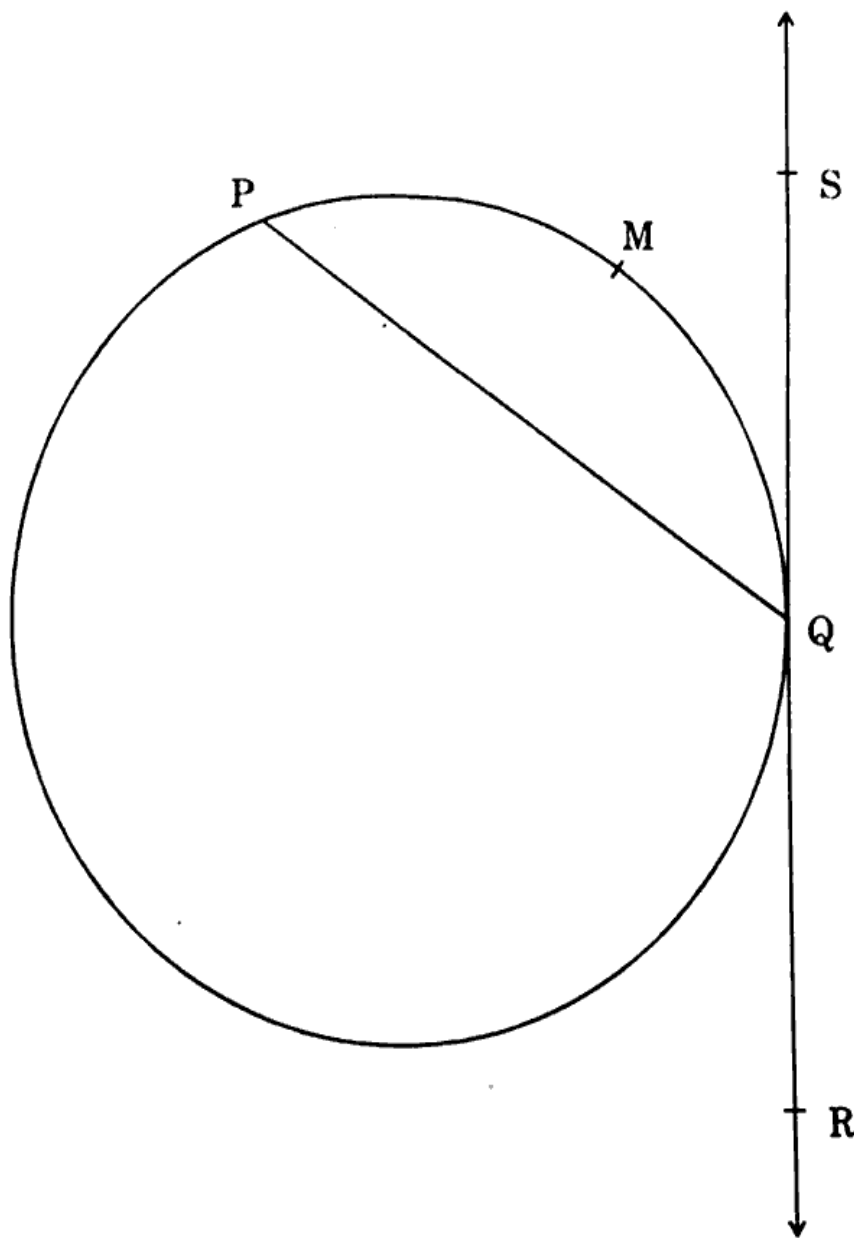
- (i) $\Delta DEF \sim \Delta MNK$. If $DE = 4$, $MN = 9$, then find the value of $\frac{A(\Delta DEF)}{A(\Delta MNK)}$.
- (ii) In the following figure, in ΔABC , $\angle B = 90^\circ$, $\angle C = 60^\circ$, $\angle A = 30^\circ$, $AC = 20$ cm. Find BC .



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(iii) In the following figure $m(\text{arc PMQ}) = 140^\circ$, find $\angle PQS$.



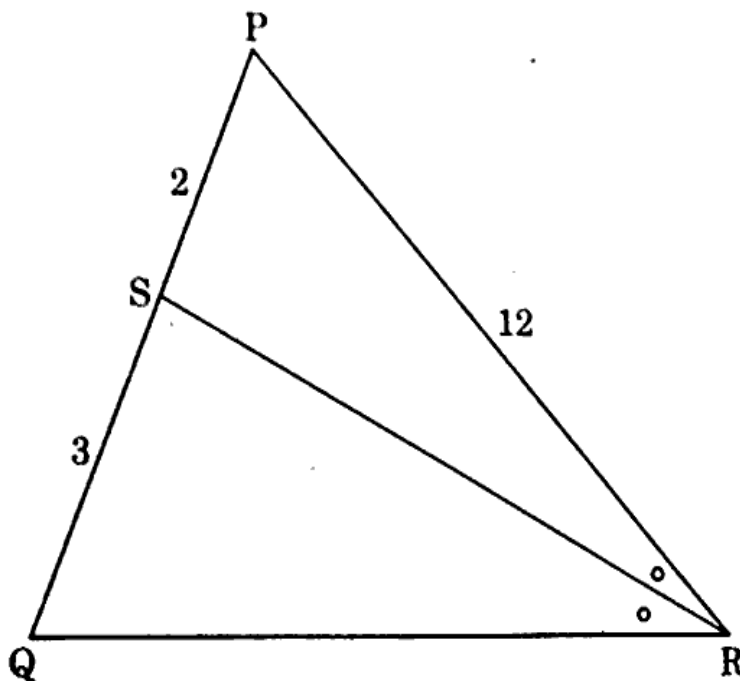
(iv) If the angle $\theta = -45^\circ$, find the value of $\cos \theta$.

(v) Find the slope of the line with inclination 0° .

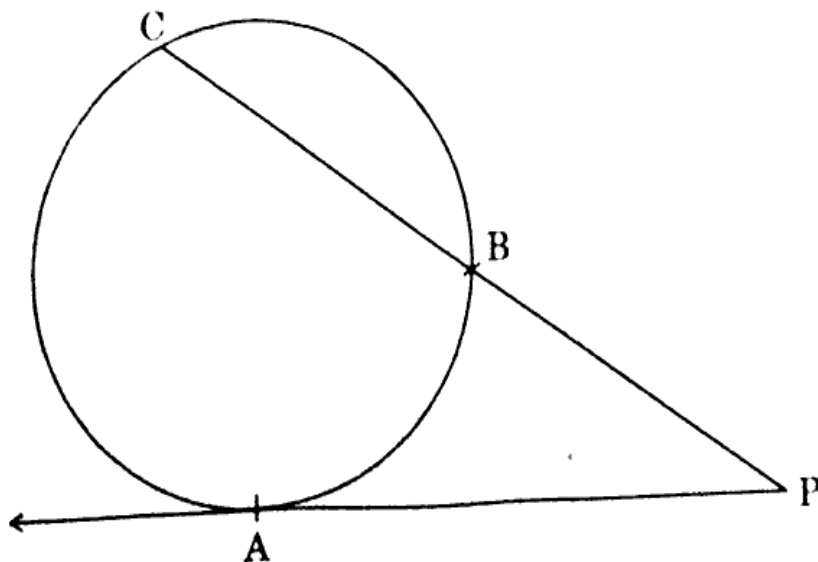
(vi) Using Euler's formula, find V if $E = 16$, $F = 10$.

D**3/N 738-z****2. Solve any four sub-questions :****8**

- (i) In the following figure, in ΔPQR , seg RS is the bisector of $\angle PRQ$.
If $PS = 2$, $SQ = 3$, $PR = 12$, find QR .



- (ii) In the following figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If $AP = 8$, $BP = 4$, find BC .



P.T.O.

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- (iii) Draw an equilateral ΔABC with side 5.7 cm and construct its circumcircle.
- (iv) For the angle in standard position if the initial arm rotates 280° in anticlockwise direction, then state the quadrant in which terminal arm lies. (Draw the figure and write the answer).
- (v) Find the area of sector whose arc length and radius are 20 cm and 11 cm respectively.
- (vi) Find the surface area of a sphere of radius 3.5 cm. $\left(\pi = \frac{22}{7}\right)$

3. Solve any three sub-questions :

9

- (i) Adjacent sides of a parallelogram are 11 cm and 17 cm. If the length of one of its diagonal is 26 cm, find the length of the other.

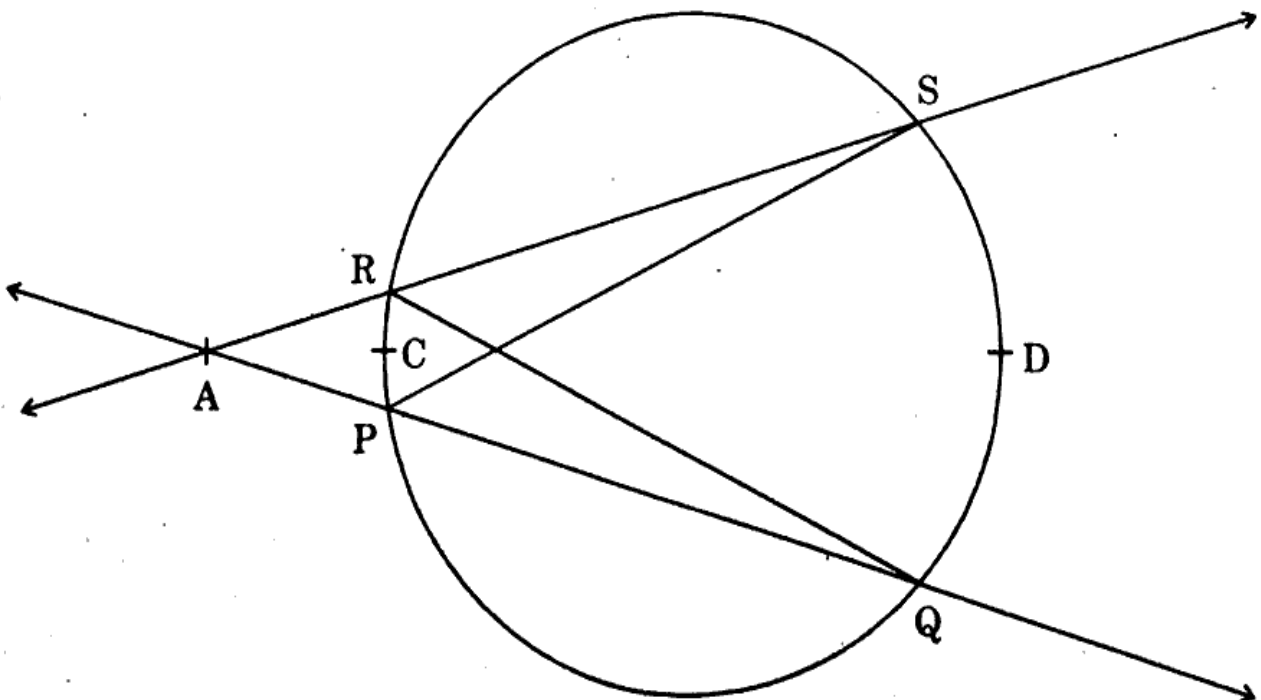
D**5/N 738-z**

- (ii) In the following figure, secants containing chords RS and PQ of a circle intersect each other in point A in the exterior of a circle. If $m(\text{arc PCR}) = 26^\circ$, $m(\text{arc QDS}) = 48^\circ$, then find :

(i) $m \angle PQR$

(ii) $m \angle SPQ$

(iii) $m \angle RAQ$.



- (iii) Draw a circle of radius 3.5 cm. Take any point K on it. Draw a tangent to the circle at K without using centre of the circle.

P.T.O.

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(iv) If $\sec \alpha = \frac{2}{\sqrt{3}}$, then find the value of $\frac{1 - \operatorname{cosec} \alpha}{1 + \operatorname{cosec} \alpha}$, where α is in IV quadrant.

(v) Write the equation of the line passing through the pair of points (2, 3) and (4, 7) in the form of $y = mx + c$.

4. Solve any two sub-questions :

8

(i) Prove that "The length of the two tangent segments to a circle drawn from an external point are equal." <https://www.maharashtrastudy.com>

(ii) A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60° .

When he moves 40 m away from the bank, he finds the angle of elevation to be 30° . Find the height of the tree and width of the river.

$$(\sqrt{3} = 1.73)$$

(iii) A(5, 4), B(-3, -2) and C(1, -8) are the vertices of a triangle ABC.

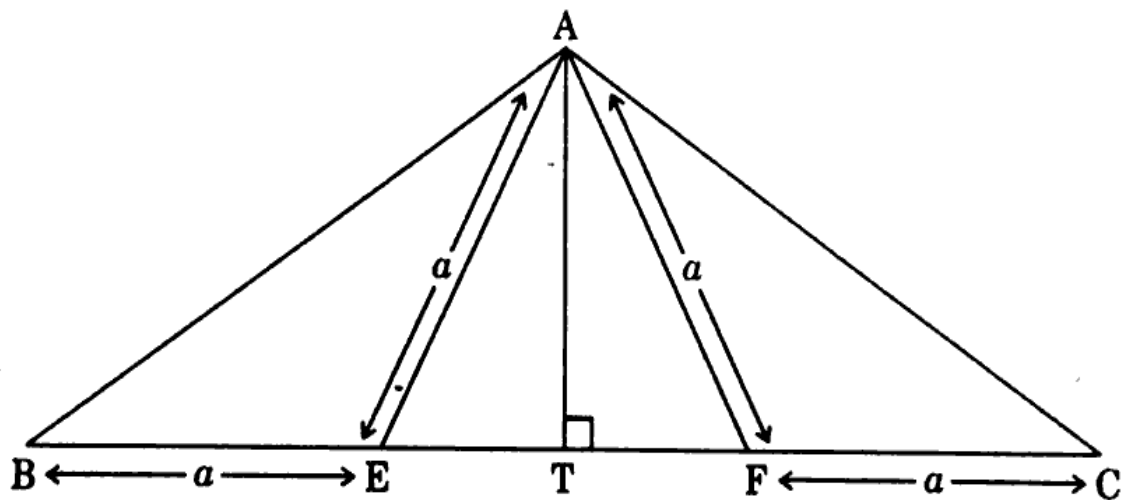
Find the equations of median AD and line parallel to AC passing through the point B.

5. Solve any *two* sub-questions :

10

- (i) In the following figure, $AE = EF = AF = BE = CF = a$, $AT \perp BC$.

Show that $AB = AC = \sqrt{3} \times a$.



- (ii) $\Delta SHR \sim \Delta SVU$. In ΔSHR , $SH = 4.5$ cm, $HR = 5.2$ cm, $SR = 5.8$ cm and $\frac{SH}{SV} = \frac{3}{5}$. Construct ΔSVU .
- (iii) Water flows at the rate of 15 m per minute through a cylindrical pipe, having the diameter 20 mm. How much time will it take to fill a conical vessel of base diameter 40 cm and depth 45 cm ?

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