BOARD QUESTION PAPER :MARCH 2013

Time: 2 $\frac{1}{2}$ Hours **Max. Marks: 60**

Note:

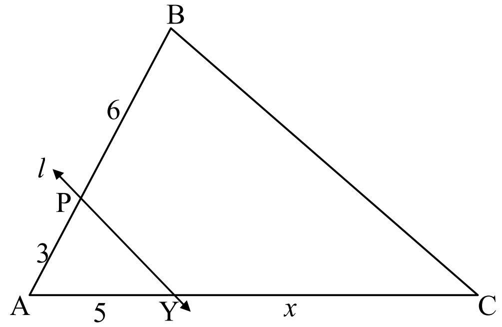
Q.P. SET CODE

C

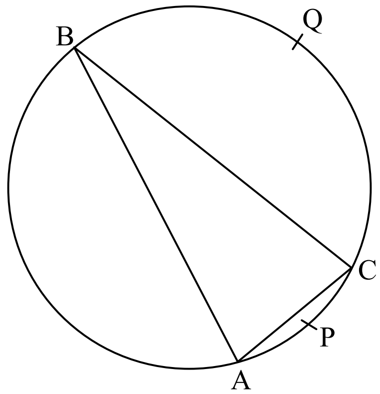
i. Solve *All* questions. Draw diagrams wherever necessary.
ii. Use of calculator is not allowed.
iii. Figures to the right indicate full marks.
iv. Marks of constructions should be distinct. They should not be rubbed off.
v. Diagram is essential for the proof of the theorem.

1. Solve any six sub-questions: **[6]**

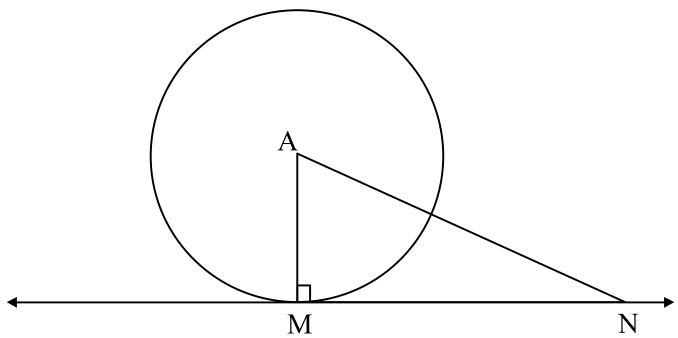
i. In the following figure, line l ∥ side BC, AP = 3, PB = 6, AY = 5, YC = x, then find x.



ii. In the following figure, m(arc APC) = 60°, find ∠ABC.



iii. In the following figure, point A is the centre of the circle, seg AM ⊥ line MN, AN = 10 cm, line MN is tangent at M. Determine radius of the circle if MN = 5 cm.



iv. If $\sin\theta = \frac{1}{2}$, then find the value of acute angle θ.

v. Find the slope and y-intercept of the line $y = -3x - 5$.

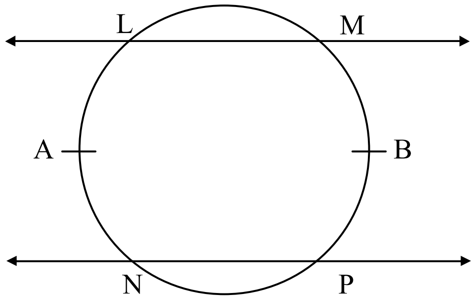
vi. Find the area of sector whose arc-length and radius are 10 cm and 5 cm respectively.

vii. Find the volume of cube with side 6 cm.

2. Solve any five sub-questions: **[10]**

i. A ladder, 13 m long, reaches a window 12 m above the ground. Find the distance of the foot of the ladder from the base of the wall.

ii. In the following circle, m(arc LAN) = m(arc MBP), prove that LM || NP.



iii. If $\tan\theta = 4$, where θ is an acute angle, find $\sec\theta$ using the identity.

iv. Show that:

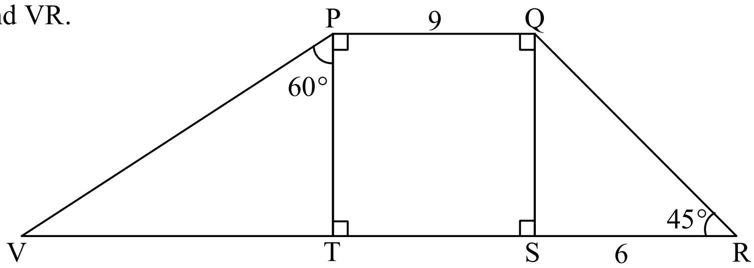
$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \frac{1+\sin\theta}{\cos\theta}$$

v. Write the equation of line $x + 2y - 4 = 0$ in slope intercept form and then find the slope and y-intercept of the line.

vi. The radius of the base of a right circular cylinder is 6 cm and height is 7 cm. Find its volume. $\left(\pi = \frac{22}{7}\right)$

3. Solve any four sub-questions: **[12]**

i. In the following figure, □PQRV is a trapezium in which seg PQ ∥ seg VR, SR = 6, PQ = 9, then find VR.



ii. Draw incircle of an equilateral ΔXYZ with side 5.3 cm.

iii. Eliminate θ, if $x = r \operatorname{cosec}\theta$, $x = y\cot\theta$.

iv. Using slope concept, check whether the points X(–1, 3), Y(8, –3) and Z(2, 1) are collinear.

v. The diameter of a circle is 10 cm. Find the length of the arc, if the corresponding central angle is 180^0. ($\pi = 3.14$)

4. Solve any three sub-questions: **[12]**

*i. Prove that "If a line divides any two sides of a triangle in the same ratio, then that line is parallel to the third side."

ii. Prove that "An exterior angle of cyclic quadrilateral is congruent to the angle opposite to its adjacent interior angle."

*iii. Construct ΔGPR such that GR = 5.3 cm, $\angle$ GPR = 70^0, PM $\perp$ GR and PM = 3.5 cm.

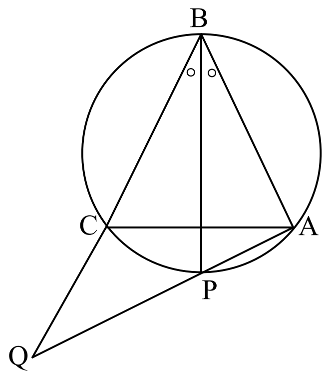
iv. Two electric poles of equal heights are opposite to each other on either side of a road. Width of the road is 100 m. The angles of elevation observed from a point between two poles on the road to the tops of the poles are 30° and 60°. Find the height of the pole and the distance of that point from each pole.

5. Solve any four sub-questions: **[20]**

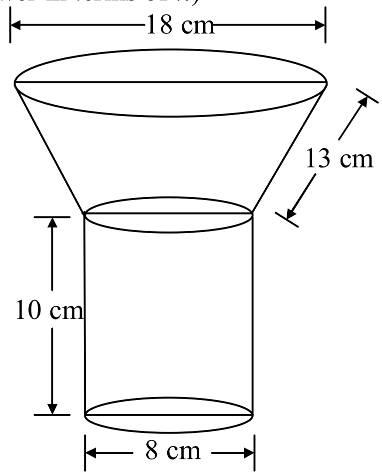
i. Prove that "In a right-angled triangle, the square of hypotenuse is equal to the sum of the squares of the remaining two sides."

ii. In the following figure, ΔABC is an equilateral triangle. Bisector of $\angle$B intersects circumcircle of ΔABC in point P. Prove that:

CQ = CA



iii. A funnel of tin sheet consists of a cylindrical portion, 10 cm long, attached to a frustum of a cone. If diameter of the top and bottom of the frustum is 18 cm and 8 cm respectively and the slant height of the frustum of cone is 13 cm, find the surface area of the tin required to make the funnel. (Express your answer in terms of π)



iv. If the points A(1, 2), B(4, 6), C(3, 5) are the vertices of a ΔABC, find the equation of the line passing through the midpoints of AB and BC.

v. Draw a triangle ABC, right-angled at B, such that AB = 3 cm, BC = 4 cm. Now construct a triangle PBQ similar to ΔABC, each of whose sides is $\frac{7}{4}$ times the corresponding side of ΔABC.