

BOARD QUESTION PAPER : OCTOBER 2014 GEOMETRY

Time: 2 Hours

Max. Marks: 40

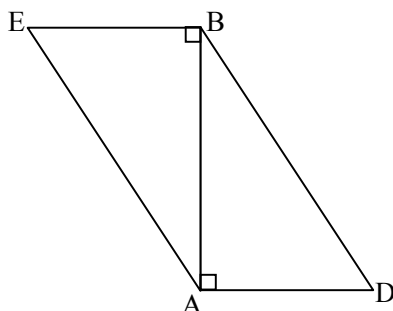
Note:

- 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.

Q.1. Solve any five sub-questions:

[5]

- i. In the figure given below, $\text{seg } BE \perp \text{seg } AB$ and $\text{seg } BA \perp \text{seg } AD$. If $BE = 6$ and $AD = 9$, find $\frac{A(\triangle ABE)}{A(\triangle BAD)}$.

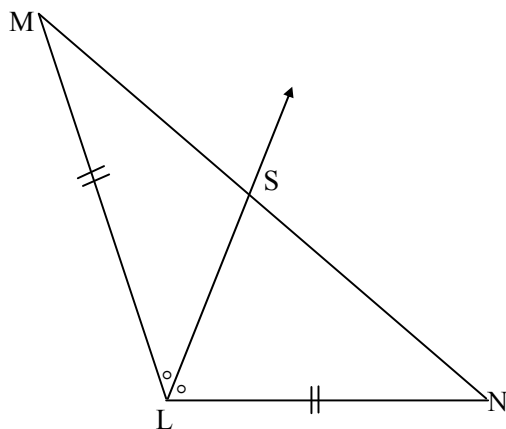


- ii. If two circles having centre P and Q touches externally each other with their radii 3 cm and 5 cm, find the distance PQ.
- iii. The terminal arm is in II (second) quadrant, what is the possible measure of an angle.
- iv. Find the slope of line having inclination 60° .
- v. Find the area of sector of circle having radius 6 cm and length of the arc 15 cm.
- vi. Sides of the triangle are 7 cm, 24 cm and 25 cm. Determine whether the triangle is right angled triangle or not.

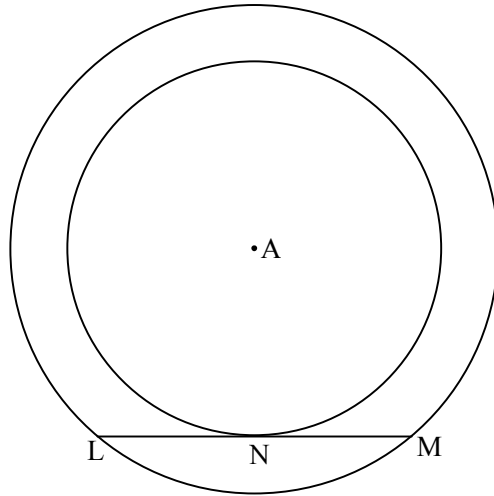
Q.2. Solve any four sub-questions:

[8]

- i. In the figure given below, Ray LS is the bisector of $\angle MLN$, where $\text{seg } ML \cong \text{seg } LN$, find the relation between MS and SN.



- ii. As shown in the figure below two concentric circles are given and line LM is the tangent to the smaller circle at N. Prove that N is the mid-point of seg LM.

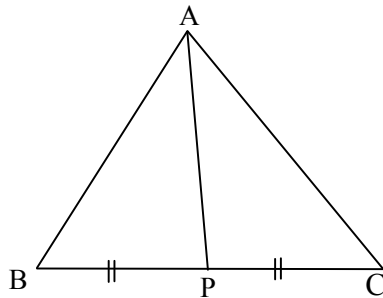


- iii. Find the slope of line passing through the point P(3, 2), Q(4, 1).
 iv. If $\tan \theta = 4$, where θ is an acute angle, find the value of $\cos \theta$.
 v. Draw the tangent at any point M on the circle of radius 3.5 cm with centre O.
 vi. Find the slope and Y-intercept of line $y - 5x = 4$.

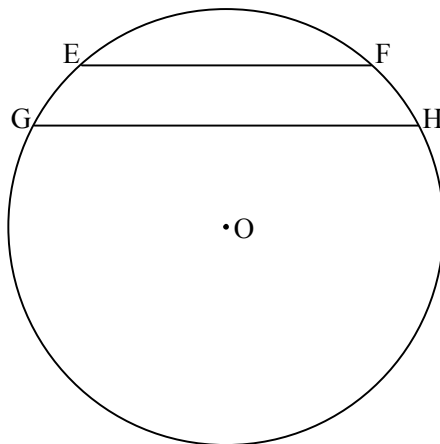
Q.3. Solve any three sub-questions:

[9]

- i. In the figure given below, ΔABC , seg AP is the median. If $AP = 7$, $AB^2 + AC^2 = 260$, find BC.



- ii. In the figure given below two chords EF and GH are parallel to each other. O is the centre of the circle. Show that $\angle EOG \cong \angle FOH$.



iii. Draw the circumcircle of ΔPMT in which $PM = 5.6$ cm, $\angle P = 60^\circ$, $\angle M = 70^\circ$.

iv. Prove that:

$$\sqrt{\frac{1 + \cos A}{1 - \cos A}} = \operatorname{cosec} A + \cot A.$$

v. Find the equation of line passing through (3, 4) and making intercepts equal in the magnitude but opposite in sign on both the axes.

Q.4. Solve any two sub-questions:

[8]

i. Prove that : The length of two tangent segments drawn to the circle from an external point are equal.

ii. A tree is broken by wind. The top struck the ground at an angle of 30° and at a distance 30 m from the root. Find the whole height of tree. ($\sqrt{3} = 1.73$)

iii. The dimensions of metallic cuboid are 44 cm \times 42 cm \times 21 cm. It is molten and recast into a sphere. Find the surface area of the sphere.

Q.5. Solve any two sub-questions:

[10]

i. If the angles of a triangle are 30° , 60° and 90° , then show that the side opposite to 30° is half of the hypotenuse and side opposite to 60° is $\frac{\sqrt{3}}{2}$ times of hypotenuse.

ii. $\Delta AMT \sim \Delta AHE$. In ΔAMT , $MA = 6.3$ cm, $\angle MAT = 120^\circ$, $AT = 4.9$ cm, $\frac{MA}{HA} = \frac{7}{5}$.
Construct ΔAHE .

iii. Water flows at the rate of 10 metres per minute through a cylindrical pipe having its diameter 20 mm. How much time will it take to fill a conical vessel of base diameter 40 cm and depth 24 cm?