BOARD QUESTION PAPER : JULY 2017
GEOMETRY

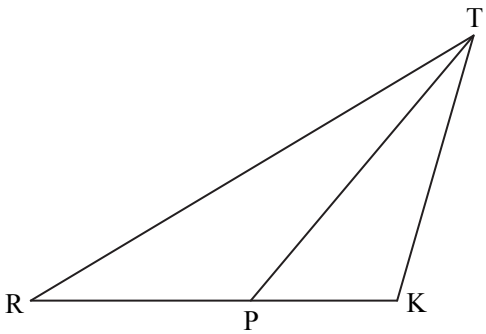
Time: 2 Hours **Max. Marks: 40**

Note:

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

1. Solve any five sub-questions: **[5]**

i. In the following figure RP : PK = 3 : 2, then find the value of A(ΔTRP) : A(ΔTPK).



ii. If two circles with radii 8 and 3 respectively touch externally, then find the distance between their centres.

iii. If the angle θ = – 60°, find the value of cos θ.

iv. Find the slope of the line having inclination 45°.

v. Find the side of the square whose diagonal is $16\sqrt{2}$ cm.

vi. Find the volume of a cube with side 6 cm.

2. Solve any four sub-questions: **[8]**

i. Sides of a triangle are 7, 24 and 25. Determine whether the triangle is right-angled triangle or not.

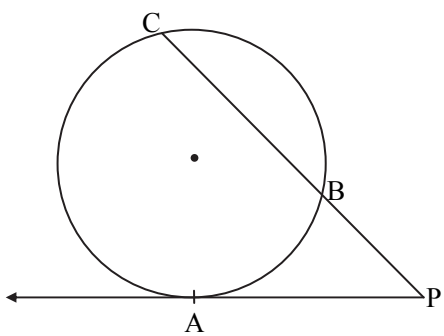
ii. The diameter of a sphere is 6 cm. Find the total surface area of the sphere. ($\pi = 3.14$)

iii. Draw a tangent at any point 'M' on the circle of radius 3.3 cm and centre 'O'.

iv. If $\sin\theta = \frac{8}{17}$, where θ is an acute angle, find the value of cos θ by using identities.

v. Find the area of the sector of a circle of radius 8 cm and arc with length 15 cm.

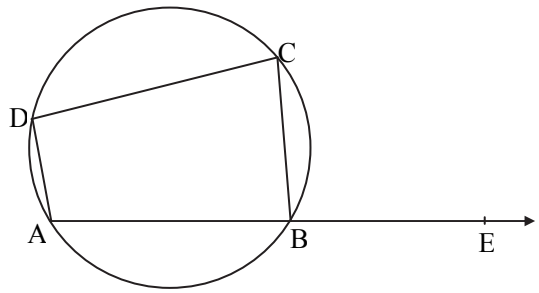
vi. In the given figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If AP = 15 cm and BP = 10 cm, find the length of PC.



3. Solve any three sub-questions: **[9]**

i. In ΔPQR, ∠P = 30°, ∠Q = 60°, ∠R = 90° and PQ = 12 cm, then find PR and QR.

ii. □ ABCD is a cyclic quadrilateral. m (arc ABC) = 230°. Find ∠ABC, ∠CDA and ∠CBE.



iii. Draw the circumcircle of ΔPMT in which PM = 5.6 cm, ∠ P = 60°, ∠ M = 70°.

iv. Prove that: $\sec^2\theta + \operatorname{cosec}^2\theta = \sec^2\theta \times \operatorname{cosec}^2\theta$.

v. Find the equation of the line passing through the points (4, – 5) and (–1, –2).

4. Solve any two sub-questions: **[8]**

i. Prove that, "The lengths of the two tangent segments to a circle drawn from an external point are equal."

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 the width of the river. $\left(\sqrt{3} = 1.73\right)$

iii. If P(–2, 4), Q(4, 8), R(10, 5) and S(4, 1) are the vertices of a quadrilateral, show that it is a parallelogram.

5. Solve any two sub-questions: **[10]**

i. Prove that "The ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides."

ii. Draw a triangle ABC with side BC = 6 cm, ∠ B = 45° and ∠A = 100°, then construct a triangle PBQ whose sides are $\frac{7}{4}$ times the corresponding sides of ΔABC.

iii. A tin maker converts a cubical metallic box into 10 cylindrical tins. Side of the cube is 50 cm and radius of the cylinder is 7 cm. Find the height of each cylinder so made, if the wastage of 12% is incurred in the process. $\left(\pi = \frac{22}{7}\right)$