

BOARD QUESTION PAPER : JULY 2017

GEOMETRY

Time: 2 Hours

Max. Marks: 40

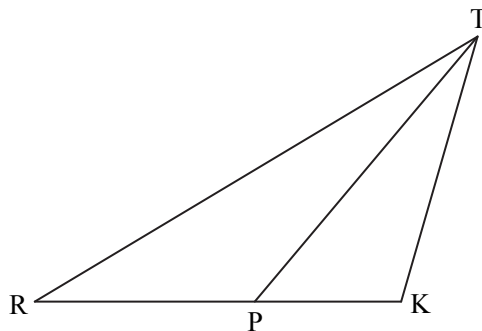
Note:

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

1. Solve any five sub-questions:

[5]

- In the following figure $RP : PK = 3 : 2$, then find the value of $A(\Delta TRP) : A(\Delta TPK)$.

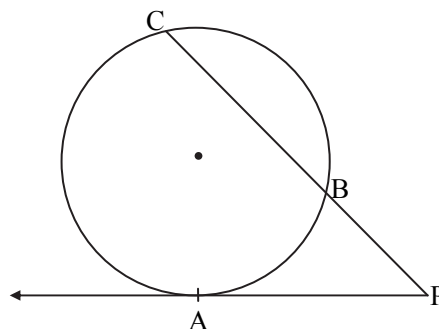


- If two circles with radii 8 and 3 respectively touch externally, then find the distance between their centres.
- If the angle $\theta = -60^\circ$, find the value of $\cos \theta$.
- Find the slope of the line having inclination 45° .
- Find the side of the square whose diagonal is $16\sqrt{2}$ cm.
- Find the volume of a cube with side 6 cm.

2. Solve any four sub-questions:

[8]

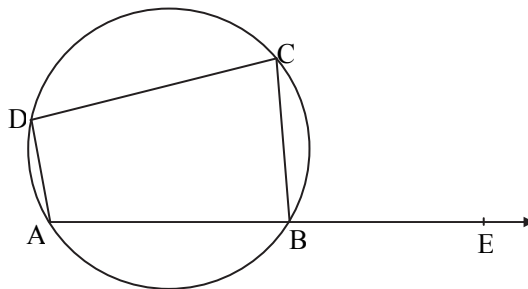
- Sides of a triangle are 7, 24 and 25. Determine whether the triangle is right-angled triangle or not.
- The diameter of a sphere is 6 cm. Find the total surface area of the sphere. ($\pi = 3.14$)
- Draw a tangent at any point 'M' on the circle of radius 3.3 cm and centre 'O'.
- If $\sin \theta = \frac{8}{17}$, where θ is an acute angle, find the value of $\cos \theta$ by using identities.
- Find the area of the sector of a circle of radius 8 cm and arc with length 15 cm.
- 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 , $\angle P = 30^\circ$, $\angle Q = 60^\circ$, $\angle R = 90^\circ$ and $PQ = 12$ cm, then find PR and QR .
- ii. $\square ABCD$ is a cyclic quadrilateral. $m(\text{arc } ABC) = 230^\circ$. Find $\angle ABC$, $\angle CDA$ and $\angle CBE$.



- iii. Draw the circumcircle of ΔPMT in which $PM = 5.6$ cm, $\angle P = 60^\circ$, $\angle M = 70^\circ$.
- 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. ($\sqrt{3} = 1.73$)
- 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, $\angle B = 45^\circ$ and $\angle A = 100^\circ$, 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. ($\pi = \frac{22}{7}$)