

BOARD QUESTION PAPER : MARCH 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.

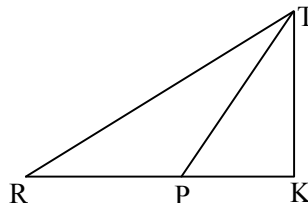
Q.P. SET CODE

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Q.1. Solve any five sub-questions:

[5]

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

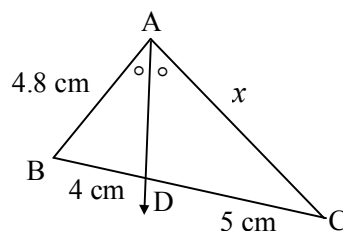


- ii. If two circles with radii 8 cm and 3 cm respectively touch internally, then find the distance between their centres.
- iii. If the angle $\theta = -60^\circ$, find the value of $\sin \theta$.
- iv. Find the slope of the line passing through the points $A(2, 3)$ and $B(4, 7)$.
- v. The radius of a circle is 7 cm. Find the circumference of the circle.
- vi. If the sides of a triangle are 6 cm, 8 cm and 10 cm respectively, determine whether the triangle is right angled triangle or not.

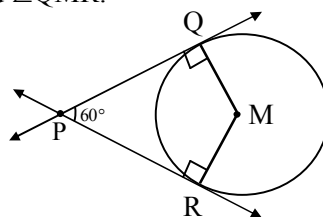
Q.2. Solve any four sub-questions:

[8]

- i. In the following figure, ray AD is a bisector of $\angle BAC$. If $AB = 4.8$ cm, $BD = 4$ cm and $DC = 5$ cm, find the value of x .



- ii. In the following figure, M is the centre of the circle. PQ and PR are tangents to the circle. If $\angle QPR = 60^\circ$, find $\angle QMR$.



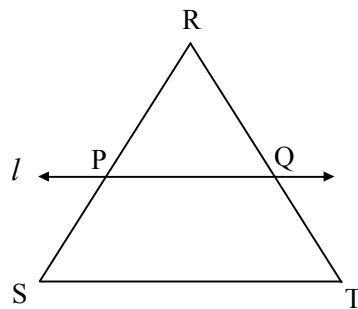
- iii. Write the equation $3x - 2y - 4 = 0$ in the slope-intercept form. Hence write the slope and y -intercept of the line.
- iv. If $\sin \theta = \frac{\sqrt{3}}{2}$, where θ is an acute angle, then find the value of $\cos \theta$.
- v. If $(5, -2)$ is a point on the line PQ and slope of the line PQ is (2) , write the equation of the line PQ.
- vi. Draw a tangent at a point 'A' on the circle of radius 3.5 cm and centre P.

Q.3. Solve any three sub-questions:

[9]

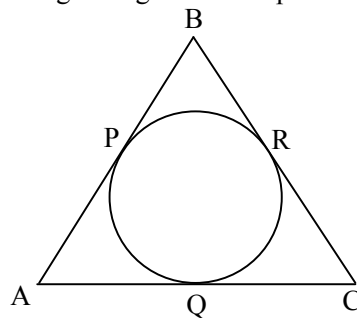
- i. In triangle RST, line $l \parallel$ side ST and line l intersects side RS and side RT in points P and Q respectively. R-P-S and R-Q-T, then prove that:

$$\frac{RP}{PS} = \frac{RQ}{QT}$$



- ii. In the following figure, ΔABC is an isosceles triangle with perimeter 40 cm. The base AC is of length 10 cm. Side AB and side BC are congruent. A circle touches the three sides as shown in the figure below.

Find the length of the tangent segment from point B to the circle.



- iii. Draw a tangent to the circle with centre 'P' and radius 3.4 cm, from a point Q at a distance of 7.2 cm from the centre of the circle.
- iv. Prove that:
 $\sec^2 A + \operatorname{cosec}^2 A = \sec^2 A \times \operatorname{cosec}^2 A$.
- v. Write the equation of each of the following lines:
 1. The line passing through the origin and the point $(-3, 4)$.
 2. The line passing through the point $(-3, 5)$ and parallel to X-axis.
 3. The X-axis and the Y-axis.

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

- i. From the top of a lighthouse, an observer looks at a ship and finds the angle of depression to be 60° . If the height of the lighthouse is 90 metres, then find how far is that ship from the lighthouse? ($\sqrt{3} = 1.73$)
- ii. Prove that “the opposite angles of the cyclic quadrilateral are supplementary”.
- iii. The sum of length, breadth and height of a cuboid is 38 cm and the length of its diagonal is 22 cm. Find the total surface area of the cuboid.

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

- i. In triangle ABC, $\angle C = 90^\circ$. Let $BC = a$, $CA = b$, $AB = c$ and let ‘p’ be the length of the perpendicular from ‘C’ on AB,
Prove that:
 1. $cp = ab$
 2. $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.
- ii. Construct the circumcircle and incircle of an equilateral triangle ABC with side 6 cm and centre O. Find the ratio of radii of circumcircle and incircle.
- iii. There are three stair-steps as shown in the figure below. Each stair-step has width 25 cm, height 12 cm and length 50 cm. How many bricks have been used in it, if each brick is $12.5 \text{ cm} \times 6.25 \text{ cm} \times 4 \text{ cm}$?

