



BOARD QUESTION PAPER : MARCH 2018

GEOMETRY

Time: 2 Hours

Max. Marks: 40

Note:

- Solve *all* questions. Draw diagrams wherever necessary.
- Use of calculator is not allowed.
- Figures to the right indicate full marks.
- Marks of constructions should be distinct. They should not be rubbed off.
- Diagram is essential for writing the proof of the theorem.

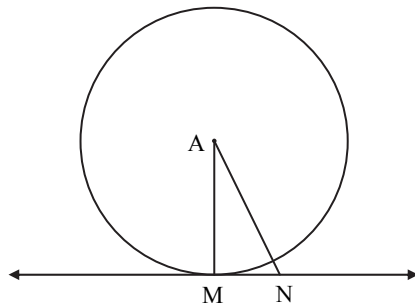
Q.P. SET CODE

B**1. Attempt any five sub-questions from the following :****[5]**

- $\Delta DEF \sim \Delta MNK$. If $DE = 5$ and $MN = 6$, then find the value of $\frac{A(\Delta DEF)}{A(\Delta MNK)}$.
- If two circles with radii 8 cm and 3 cm respectively touch externally, then find the distance between their centres.
- Find the length of the altitude of an equilateral triangle with side 6 cm.
- If $\theta = 45^\circ$, then find $\tan \theta$.
- Slope of a line is 3 and y intercept is -4 . Write the equation of a line.
- Using Euler's formula, find V , if $E = 30$, $F = 12$.

2. Attempt any four sub-questions from the following :**[8]**

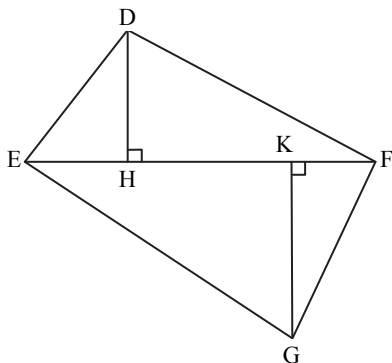
- The ratio of the areas of two triangles with common base is 4:3. Height of the larger triangle is 6 cm, then find the corresponding height of the smaller triangle.
- In the following figure, point 'A' is the centre of the circle. Line MN is tangent at point M. If $AN = 12$ cm and $MN = 6$ cm, determine the radius of the circle.



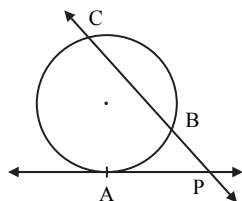
- Draw $\angle PQR$ of measure 70° and bisect it.
- If $\cos \theta = \frac{3}{5}$, where ' θ ' is an acute angle. Find the value of $\sin \theta$.
- The volume of a cube is 1000 cm^3 . Find its side.
- The radius and slant height of a cone are 4 cm and 25 cm respectively. Find the curved surface area of that cone. ($\pi = 3.14$)

3. Attempt any three sub-questions from the following :**[9]**

- In the following figure, seg $DH \perp$ seg EF and seg $GK \perp$ seg EF . If $DH = 6$ cm, $GK = 10$ cm and $A(\Delta DEF) = 150 \text{ cm}^2$, then find :
 - EF
 - $A(\Delta GEF)$
 - $A(\square DFGE)$.



- ii. In the following figure, ray PA is the tangent to the circle at point A and PBC is a secant. If AP = 14, BP = 10, then find BC.



- iii. Draw the circle with centre C and radius 3.6 cm. Take point B which is at distance 7.2 cm from the centre. Draw tangents to the circle from point B.
- iv. Show that: $\sqrt{\frac{1-\sin x}{1+\sin x}} = \sec x - \tan x$.
- v. Write the equation of the line passing through points C(4, -5) and D(-1, -2) in the form of $ax + by + c = 0$.

4. Attempt any two sub-questions from the following :

[8]

- i. Prove that, “the lengths of the two tangent segments to a circle drawn from an external point are equal”.
- ii. A tree is broken by the wind. The top of that tree struck the ground at an angle of 30° and at a distance of 30 m from the root. Find the height of the whole tree. ($\sqrt{3} = 1.73$)
- iii. A(5, 4), B(-3, -2) and C(1,-8) are the vertices of a triangle ABC. Find the equation of median AD.

5. Attempt any two sub-questions from the following :

[10]

- i. Prove that, in a right-angled triangle, the square of hypotenuse is equal to the sum of the square of remaining two sides.
- ii. $\Delta SHR \sim \Delta SVU$, in ΔSHR , SH = 4.5 cm, HR = 5.2 cm, SR = 5.8 cm and $\frac{SH}{SV} = \frac{3}{5}$.
Construct ΔSVU .
- iii. If ‘V’ is the volume of a cuboid of dimensions $a \times b \times c$ and ‘S’ is its surface area, then prove that:

$$\frac{1}{V} = \frac{2}{S} \left[\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right].$$