

Q.P. SET CODE
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MT - Z

Seat No.

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2017 __ __ 1100 - **MT - Z** - MATHEMATICS (71) GEOMETRY - SET - D (E)

Time : 2 Hours

(Pages 4)

Max. Marks : 40

Note :

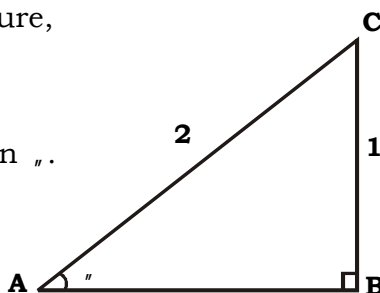
- (i) All questions are compulsory.
- (ii) Use of calculator is not allowed.

Q.1. Solve ANY FIVE of the following :

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- (i) Sides of the triangle are 7 cm, 24 cm and 25 cm. Determine whether the triangle is right-angled triangle or not.
- (ii) If two circles with radii 8 cm and 3 cm respectively touch internally, then find the distance between their centres.

- (iii) In the adjoining figure,
in $\triangle ABC$, $BC = 1$,
 $AC = 2$, $\angle B = 90^\circ$.
Find the value of $\sin A$.



- (iv) Find the slope of a line having inclination 60° .
- (v) Using Euler's formula, find V , if $E = 30$ and $F = 12$.
- (vi) Find the diagonal of a square whose side is 16 cm.

Q.2. Solve ANY FOUR of the following :

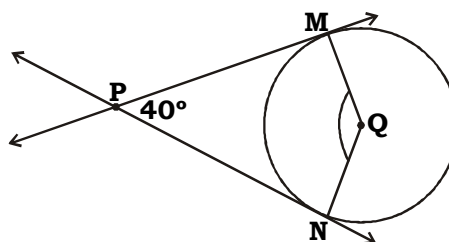
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(i) $\triangle ABC \sim \triangle DEF$

If $A(\triangle ABC) = 9 \text{ cm}^2$, $A(\triangle DEF) = 64 \text{ cm}^2$, $DE = 5.6 \text{ cm}$ then find AB .

(ii) In the adjoining figure,

Q is the centre of circle and PM and PN are tangent segments to the circle. If $\angle MPN = 40^\circ$ circle, find $\angle MQN$.



(iii) Find the length of the arc of a circle with radius 0.7 m and area of the sector is 0.49 m^2 .

(iv) For the angle in standard position if the initial arm rotates 25° in anticlockwise direction then terminal arm is in which quadrant ? Also draw a figure for the same.

(v) An arc of a circle having measure 36 has length 176 m. Find the circumference of the circle.

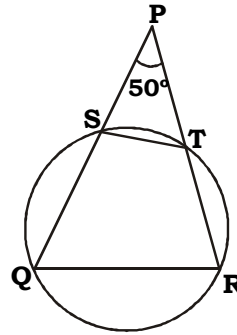
(vi) Draw a tangent at any point 'M' on the circle of radius 2.9 cm and centre 'O'.

Q.3. Solve ANY THREE of the following :

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(i) A vertical stick 12 m long casts a shadow 8 m long on the ground. At the same time a tower casts the shadow 40 m on the ground. Determine the height of the tower.

- (ii) In the adjoining figure,
in the isosceles triangle PQR,
the vertical $\angle P = 50^\circ$. The circle
passing through Q and R cuts PQ .
in S and PR in T. ST is joined.
Find $\angle PST$.



- (iii) Construct tangents to the circle from point B with radius 3.5 cm
and centre A. Point B is at a distance 7.3 cm from the centre.
- (iv) 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 ?
($\sqrt{3} = 1.73$)
- (v) Find the value of k if $(-3, 11)$, $(6, 2)$ and $(k, 4)$ are collinear points.

Q.4. Solve ANY TWO of the following :

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- (i) Show that : $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cdot \cos \theta$
- (ii) Prove : The opposite angles of a cyclic quadrilateral are supplementary.
- (iii) A $(5, 4)$, B $(-3, -2)$ and C $(1, -8)$ are the vertices of a triangle ABC. Find
the equation of median AD and line parallel to AC passing through
point B.

Q.5. Solve ANY TWO of the following :

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- (i) Prove : In a triangle, the angle bisector divides the side opposite to the angle in the ratio of the remaining sides.
- (ii) $\triangle AMT \sim \triangle AHE$, In $\triangle AMT$, $MA = 6.3$ cm, $\angle MAT = 120^\circ$, $AT = 4.9$ cm and $\frac{MA}{HA} = \frac{7}{5}$, construct $\triangle AHE$.
- (iii) Marbles of diameter 1.4 cm are dropped into a beaker containing some water and are fully submerged. The diameter of the beaker is 7 cm. Find how many marbles have been dropped in it if the water rises by 5.6 cm.

Best Of Luck 🍀