MT

2017 ___ ___ 1100 **Seat No.** | | | | | | | |

MT - GEOMETRY - SEMI PRELIM - II : PAPER - 3

Time : 2 Hours **(Pages 4)** **Max. Marks : 40**

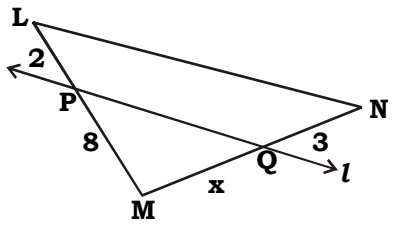
Note :

(i) All questions are compulsory.

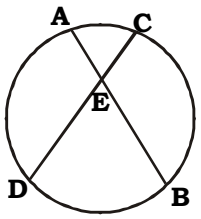
(ii) Use of calculator is not allowed.

Q.1. Attempt ANY FIVE of the following : **5**

(i) Find the value of x in the adjoining figure, if line l is parallel to one of the sides of the given triangle.



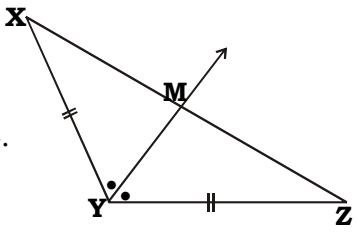
(ii) In the adjoining figure, chords AB and CD intersect at E. If DE = 6, BE = 3 and CE = 4, then find AE.



(iii) Using Euler's formula, find F, if V = 6 and E = 12.

(iv) If two circles touch externally then show that the distance between their centres is equal to the sum of their radii.

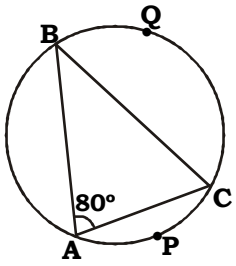
(v) Ray YM is the angle bisector of $\angle XYZ$, where XY = YZ. Find the relation between XM and MZ.



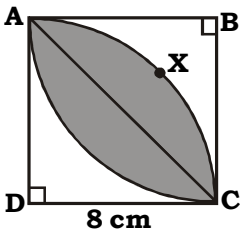
(vi) A cylinder and a cone have equal radii and equal heights. If the volume of the cylinder is 300 cm^3, what is the volume of the cone ?

Q.2. Solve ANY FOUR of the following : **8**

(i) . . . . . ∠BAC = 80°
Find (a) ∠ABC (b) m (arc BQC).

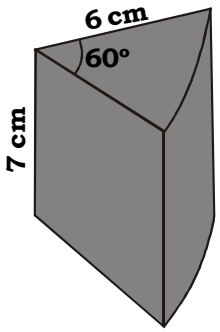


(ii) Calculate the area of the shaded region in the adjoining figure where □ABCD is a square with side 8 cm each. (® = 3.14)

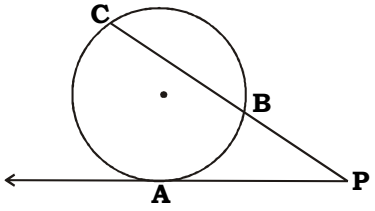


(iii) Find the side of square whose diagonal is $16\sqrt{2}$ cm.

(iv) A piece of cheese is cut in the shape of the sector of a circle of radius 6 cm. The thickness of the cheese is 7 cm. Find the curved surface area of the cheese.



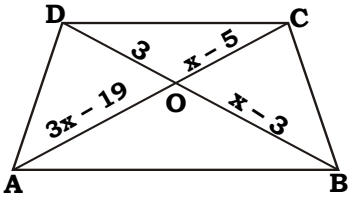
(v) In the adjoining figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If AP = 15 and BP = 10,find BC.



(vi) In ΔPQR, seg PM is the median. If PM = 9 and $PQ^2 + PR^2 = 290$. Find QR.

Q.3. Solve ANY THREE of the following : **9**

(i) In the adjoining figure, AB || DC. Using the information given find the value of x.

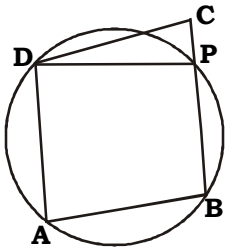


(ii) A roller of diameter 0.9 m and length 1.8 m is used to press the ground. Find the area of ground pressed by it in 500 revolutions. (Given ® = 3.14)

(iii) Suppose ABC is a triangle inscribed in a circle, the bisector of ∠ABC intersects the circle again in D, the tangent at D intersect the line BA and line BC in E and F respectively. Prove that ∠EDA ≅ ∠FDC.

(iv) □ABCD is a trapezium in which AB || DC and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

(v) □ABCD is a parallelogram. A circle passing through D, A, B cuts BC in P. Prove that DC = DP.

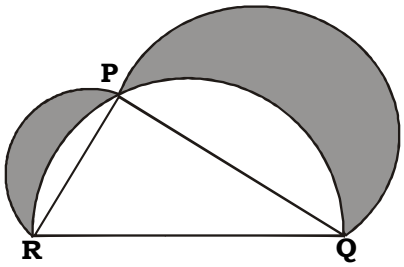


Q.4. Solve ANY TWO of the following : **8**

(i) Prove that : The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

(ii) Prove that : The opposite angles of a cyclic quadrilateral are supplementary.

(iii) In the adjoining figure, PR = 6 units and PQ = 8 units. Semicircles are drawn taking sides PR, RQ and PQ as diameters as shown in the figure. Find out the area of the shaded portion. (® = 3.14)

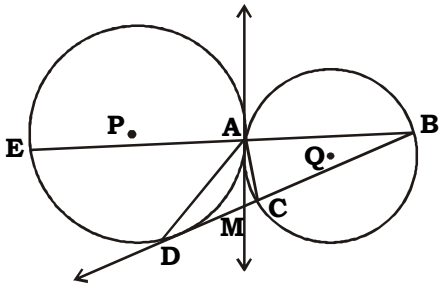


Q.5. Solve ANY TWO of the following : **10**

(i) Through the midpoint M of the side CD of parallelogram ABCD, the line BM is drawn intersecting AC in L and AD produced in E. Prove that EL = 2BL.

(ii) 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.

(iii) Let the circles with centre P and Q touch each other at point A. Let the extended chord AB intersect the circle with centre P at point E and the chord BC touches the circle with centre P at the point D. Then prove that ray AD is an angle bisector of the ∠CAE.



Best Of Luck