

<b>Q.P. SET CODE</b>
<b>B</b>

# MT - X

Seat No. 

--	--	--	--	--	--	--

2017 \_\_ \_\_ 1100 - **MT - X** - MATHEMATICS (71) GEOMETRY - SET - B (E)

**Time : 2 Hours**

**(Pages 4)**

**Max. Marks : 40**

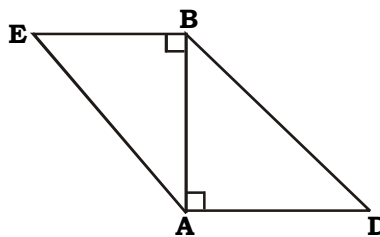
**Note :**

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

**Q.1. Solve ANY FIVE of the following :**

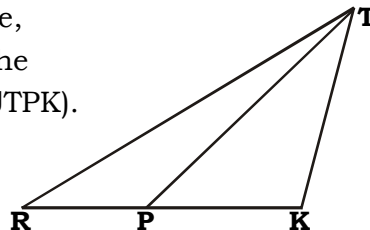
**5**

- (i) In the adjoining figure,  
seg BE ⊥ seg AB and  
seg BA ⊥ seg AD.  
If BE = 6 and AD = 9,



find  $\frac{A(\text{UABE})}{A(\text{UBAD})}$ .

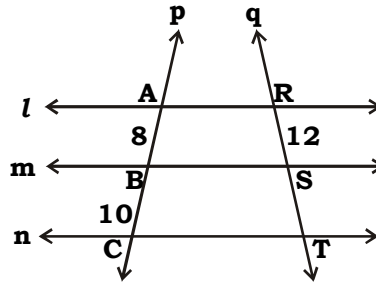
- (ii) If two circles with diameters 8 cm and 6 cm respectively touch externally find the distance between their centres.
- (iii) If the angle  $\theta = -30^\circ$ , find the value of  $\cos \theta$ .
- (iv) Write the y-intercept of the line  $3y = 2x + 7$ .
- (v) Using Euler's formula, find V if E = 10, F = 6.
- (vi) In the adjoining figure,  
RP : PK = 3 : 2, find the  
value of  $A(\text{UTRP}) : A(\text{UTPK})$ .



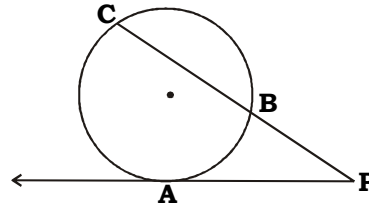
**Q.2. Solve ANY FOUR of the following :**

8

- (i) In the adjoining figure,  
line  $l \parallel$  line  $m \parallel$  line  $n$ .  
Lines  $p$  and  $q$  are transversals.  
From given information  
find  $ST$ .



- (ii) In the adjoining figure,  
a tangent segment  $PA$  touching a circle in  $A$  and a secant  $PBC$  are shown. If  $AP = 12$ ,  $BP = 9$ , find  $BC$ .



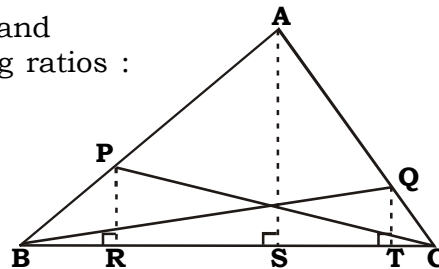
- (iii) The perimeter of one face of a cube is 24 cm.  
Find (a) the total area of the 6 faces (b) the volume of the cube.
- (iv) Find the sin ratio of  $\theta$  in standard position whose terminal arm passes through  $(5, -12)$ .
- (v) The cuboidal water tank has length 2 m, breadth 1.6 m and height 1.8 m. Find the capacity of the tank in litres.
- (vi) Draw an angle of  $125^\circ$  and bisect it.

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

9

- (i) In the adjoining figure,  
seg  $PR \perp$  seg  $BC$ , seg  $AS \perp$  seg  $BC$  and  
seg  $QT \perp$  seg  $BC$ . Find the following ratios :

- (a)  $\frac{A(UABC)}{A(UPBC)}$       (b)  $\frac{A(UABS)}{A(UASC)}$   
(c)  $\frac{A(UPRC)}{A(UBQT)}$       (d)  $\frac{A(UBPR)}{A(UCQT)}$



- (ii) Two circles with centres A, B are touching externally and a circle with centre C touches both externally. Suppose  $AB = 3$  cm,  $BC = 3$  cm,  $CA = 4$  cm. Find the radii of all circles.
- (iii) Draw the circumcircle of  $\Delta PMT$  such that,  $PM = 5.4$  cm,  $\angle P = 60^\circ$ ,  $\angle M = 70^\circ$ .
- (iv) A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to the ground. The inclination of the string with the ground is  $60^\circ$ . Find the length of the string, assuming that there is no slack in the string. ( $\sqrt{3} = 1.73$ )
- (v) Show that the line joining  $(-1, 1)$  and  $(-9, 6)$  is parallel to the line joining  $(-2, 14)$  and  $(6, 9)$ .

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

- (i) Prove :  $\sqrt{\frac{\operatorname{cosec} x - 1}{\operatorname{cosec} x + 1}} = \frac{1}{\sec x + \tan x}$
- (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 :**

**10**

- (i) Prove : In a triangle, the angle bisector divides the side opposite to the angle in the ratio of the remaining sides.
- (ii) Construct the circumcircle and incircle of an equilateral  $\Delta XYZ$  with side 6.3 cm.
- (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* 🍀