

Q.P. SET CODE
A

MT - W

Seat No.

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2018 ___ ___ 1100 - **MT - W** - MATHEMATICS (71) Geometry - SET - A (E)

Time : 2 Hours

(Pages 6)

Max. Marks : 40

Note :

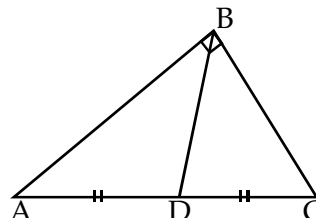
- (i) All questions are compulsory.
- (ii) Use of calculator is not allowed.
- (iii) Total marks are shown on the right side of the question.
- (iv) If necessary draw the figure to justify your answer.
- (v) Constructions marks should be distinct. Do not erase them.

Q.1.(A) Solve ANY FOUR of the following :

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- (i) Write converse of the following statement:
The diagonals of a rectangle are congruent.
- (ii) If a transversal intersects two parallel lines then the sum of interior angles on the same side of the transversal is _____.

- (iii) In $\triangle ABC$, $\angle ABC = 90^\circ$
Seg BD is the median
on hypotenuse AC
BD = 7 cm
Find : AC



- (iv) Identify the correct statement:
A quadrilateral is a parallelogram if a pair of opposite sides is parallel.
A quadrilateral is a parallelogram if a pair of opposite sides is congruent.
A quadrilateral is a parallelogram if a pair of opposite angles is congruent.
A quadrilateral is a parallelogram if a pair of opposite sides is parallel and congruent.
- (v) What is the equation of the Y – axis?
- (vi) Find the value of $\frac{\tan 40^\circ}{\cot 50^\circ}$.

Q.1.(B) Solve ANY TWO of the following :**4**

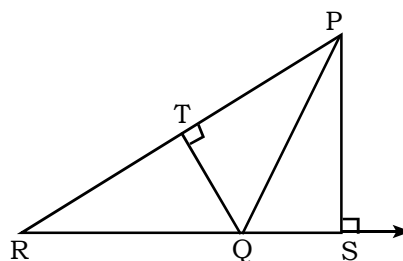
- (i) Area of the base of a cone is 1386 sq. cm and its height is 28 cm. Find its volume.
- (ii) Length of a chord of a circle is 24 cm. If distance of the chord from the centre is 5 cm, then find radius of the circle.
- (iii) In $\triangle FAN$, $\angle F = 80^\circ$, $\angle A = 40^\circ$. Find out the greatest and the smallest side of the triangle.

Q.2.(A) Select the correct alternative answer and write it :**4**

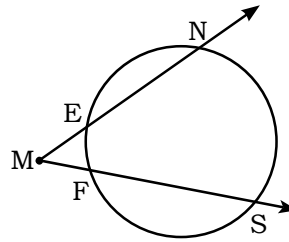
- (i) $\triangle LMN \sim \triangle PQR$, $9 \times A(\triangle PQR) = 16 \times A(\triangle LMN)$. If $QR = 20$, then find MN .
 (a) 22.5 (b) 45 (c) 15 (d) 5
- (ii) $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is equal to
 (a) $2 \cos \theta$ (b) 0 (c) $2 \sin \theta$ (d) 1
- (iii) If measure of an arc of circle is 160° and its length is 44 cm, find the circumference of the circle.
 (a) 66 cm (b) 44 cm (c) 160 cm (d) 99 cm
- (iv) Find the distance between the following points $R(0, -3)$, $S(0, \frac{5}{2})$
 (a) 7 units (b) 10.5 units (c) 4 units (d) 5.5 units

Q.2.(B) Solve ANY TWO of the following :**4**

- (i) Find k , if $R(1, -1)$, $S(-2, k)$ and slope of line RS is -2 .
- (ii) In the adjoining figure,
 seg $PS \perp$ ray RQ ,
 seg $QT \perp$ seg PR .
 If $RQ = 6$,
 $PS = 6$ and $PR = 12$
 then find QT .



- (iii) In the adjoining figure,
 $m(\text{arc NS}) = 125^\circ$,
 $m(\text{arc EF}) = 37^\circ$.
 Find $m\angle NMS$.



Q.3.(A) Carry out ANY TWO of the following activities :

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- (i) Given : In $\triangle ABC$, $\angle B = 90^\circ$
 seg $BD \perp$ hypotenuse AC
 To prove : $\triangle ADB \sim \triangle BDC$
 Proof :

In $\triangle ADB$ and $\triangle ABC$

$\angle A \cong \angle A$

$\angle ADB \cong \angle ABC$

(each 90°)

$\therefore \triangle ADB \sim \triangle ABC$... (i)

In $\triangle BDC$ and $\triangle ABC$

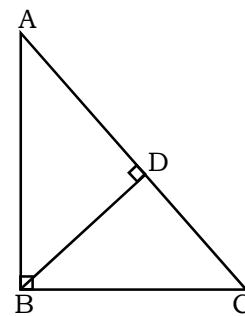
$\angle C \cong \angle C$

$\angle BDC \cong \angle ABC$

(each 90°)

$\therefore \triangle BDC \sim \triangle ABC$... (ii)

$\therefore \triangle ADB \sim \triangle BDC$



- (ii) Given : In $\triangle ABC$,
 Line $l \parallel$ side BC

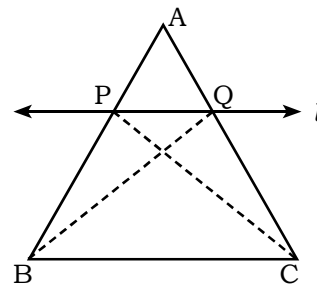
To prove : $\frac{AP}{PB} = \frac{AQ}{QC}$

Construction : Draw seg PC and seg BQ

Proof :

$\frac{A(\triangle APQ)}{A(\triangle PQB)} = \frac{\square}{\square}$ (i)

$\frac{A(\triangle APQ)}{A(\triangle PQC)} = \frac{\square}{\square}$ (ii)



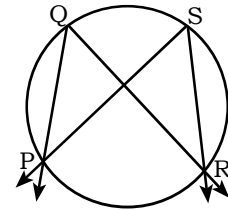
seg PQ || side BC (Given)

∴ Δ PQB and Δ PQC have equal heights.
Also they have common base PQ

∴ A () = A ()(iii)

∴ $\frac{AP}{PB} = \frac{AQ}{QC}$

(iii) Given :
∠ PQR and ∠ PSR are inscribed
in same arc PQR and intercepts
same arc PR
To prove : ∠ PQR ≅ ∠ PSR
Proof :



∠ PQR = $\frac{1}{2}$ (i) }

∠ PSR = $\frac{1}{2}$ (ii) }

∴ ∠ PQR ≅ ∠ PSR

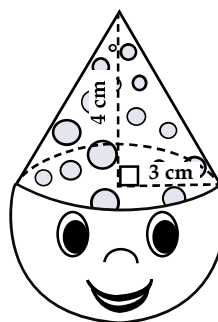
Q.3.(B) Solve ANY TWO of the following : 4

- (i) Draw any circle. Take any point A on it and construct tangent at A without using the centre of the circle.
- (ii) Find the point on X-axis which is equidistant from P(2, -5) and Q(-2,9).
- (iii) Prove that : $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \cdot \operatorname{cosec}^2 \theta$

Q.4. Solve ANY THREE of the following : 9

- (i) Two buildings are in front of each other on a road of width 15 metres. From the top of the first building, having a height of 12 metres, the angle of elevation of the top of the second building is 30°. What is the height of the second building?

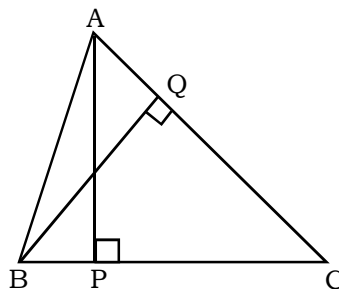
- (ii) The adjoining figure shows a toy. Its lower part is a hemisphere and the upper part is a cone. Find the surface area of the toy from the measures shown in the figure. ($\pi = 3.14$)



- (iii) $\triangle AMT \sim \triangle AHE$. In $\triangle AMT$, $AM = 6.3$ cm, $\angle TAM = 50^\circ$, and $AT = 5.6$ cm.

$$\frac{AM}{AH} = \frac{7}{5}. \text{ Construct } \triangle AHE.$$

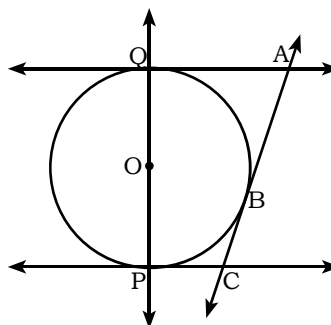
- (iv) In $\triangle ABC$, $AP \perp BC$, $BQ \perp AC$, $B-P-C$, $A-Q-C$, then prove that $\triangle CPA \sim \triangle CQB$.
If $AP = 7$, $BQ = 8$, $BC = 12$ then find AC .



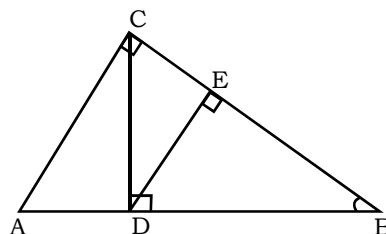
Q.5. Solve ANY ONE of the following :

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- (i) P, B and Q are points of contact of the respective tangents. line $QA \parallel$ line PC .
If $QA = 7.2$ cm, $PC = 5$ cm,
Find : Radius of the circle.



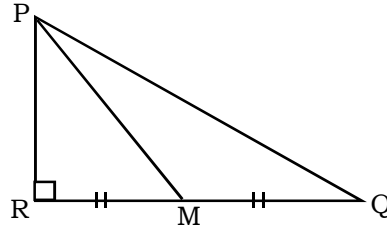
- (ii) In $\triangle ABC$, $\angle ACB = 90^\circ$
seg $CD \perp$ seg AB ,
seg $DE \perp$ seg CB .
Show that :
 $CD^2 \times AC = AD \times AB \times DE$



Q.6. Solve ANY ONE of the following :

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- (i) In the adjoining figure,
M is the midpoint of QR.
 $\angle PRQ = 90^\circ$.
Prove that
 $PQ^2 = 4PM^2 - 3PR^2$



- (ii) The radii of ends of a frustum are 14 cm and 6 cm respectively and its height is 6 cm. Find its
- Curved surface area
 - Total surface area
 - Volume
- $(\pi = 3.14)$.

Best Of Luck 🍀