

MT

2018 ____ 1100

Seat No.

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MT - GEOMETRY - SEMI PRELIM - II : PAPER - 4

Time : 2 Hours

(Pages 5)

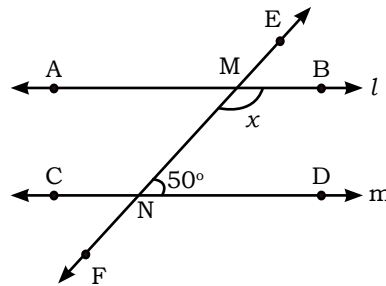
Max. Marks : 40

Q.1. (A) Solve the following : (Any 4)

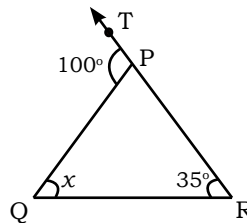
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1. Find $d(A, B)$, if co-ordinates of A and B are -2 and 5 respectively.

2. In the adjoining figure,
line $l \parallel$ line m
Find : x



3. In the adjoining figure,
find the value of x



4. Find the value of A: $\sin A = \cos (A - 30)$

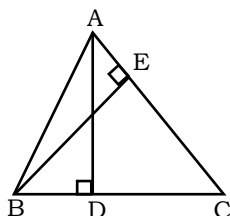
5. Find perimeter of a semicircle whose radius is 21 cm $\left(\pi = \frac{22}{7} \right)$

6. In $\triangle ABC$, if $AB > AC$, then state with reason, relation between $\angle C$ and $\angle B$.

Q.1. (B) Solve the following : (Any 2)

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1. In $\triangle ABC$, seg AD and seg BE are altitudes and $AE = BD$.
Prove $\text{seg AD} \cong \text{seg BE}$.



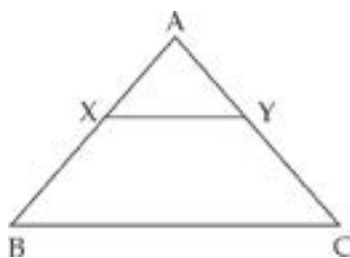
2. If $\angle A = 30^\circ$, show that $\frac{2 \tan A}{1 - \tan^2 A} = \sqrt{3}$
3. Find the slant height of a cone, if its total surface area is 7128 sq. cm and radius of base is 28 cm. $\left(\pi = \frac{22}{7}\right)$

Q.2. (A) Solve the following MCQs :

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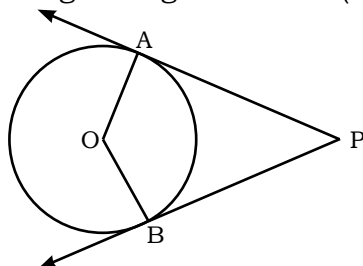
1. In the figure, $\text{seg XY} \parallel \text{seg BC}$, then which of the following statements is true?

- (A) $\frac{AB}{AC} = \frac{AX}{AY}$
 (B) $\frac{AX}{XB} = \frac{AY}{AC}$
 (C) $\frac{AX}{YC} = \frac{AY}{XB}$
 (D) $\frac{AB}{YC} = \frac{AC}{XB}$



2. When we see at a higher level from the horizontal line, angle formed is
- (A) Angle of Elevation (B) Angle of Depression
 (C) 0 (D) Straight angle
3. The ratio of circumference and area of a circle is 2 : 7. Find its circumference.
- (A) 14π (B) $\frac{7}{\pi}$ (C) 7π (D) $\frac{14}{\pi}$

4. PA and PB are tangent segments. If $m(\text{arc } AB) = 100^\circ$ Find $\angle P$

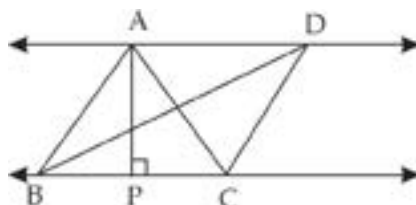


- (A) 100° (B) 80° (C) 90° (D) 70°

Q.2. (B) Solve the following : (Any 2)

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1. In adjoining figure, $AP \perp BC$, $AD \parallel BC$, then find $A(\Delta ABC) : A(\Delta BCD)$

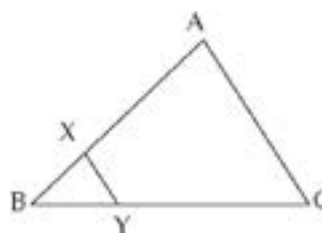


2. Measure of an arc of a circle is 80° and its radius is 18 cm.
Find the length of the arc ($\pi = 3.14$)
3. Construct a tangent to a circle with centre P and radius 3.2 cm at any point M on it.

Q.3. (A) Solve the following activity : (Any 2)

4

1. In the adjoining figure,
 $XY \parallel \text{seg } AC$.
If $2AX = 3 \times BX$
and $XY = 9$.
Complete the activity
to find the value of AC.



Activity :

$$2 AX = 3 BX \quad \therefore \frac{AX}{BX} = \frac{\square}{\square}$$

$$\therefore \frac{AX + BX}{BX} = \frac{\square + \square}{\square} \quad \dots(\text{By componendo})$$

$$\begin{aligned} \therefore \frac{AB}{BX} &= \frac{\square}{\square} && \dots(i) \\ \therefore \triangle BCA &\sim \triangle BYX && \dots(\text{By } \square \text{ test for similarity}) \\ \therefore \frac{BA}{BX} &= \frac{AC}{XY} && \dots(\text{c.s.s.t.}) \\ \therefore \frac{\square}{\square} &= \frac{AC}{9} && \dots[\text{From (i)}] \\ \therefore AC &= \square \end{aligned}$$

2. If $\tan \theta + \frac{1}{\tan \theta} = 2$, then find the value of : $\tan^2 \theta + \frac{1}{\tan^2 \theta}$
 Solution:

$$\tan \theta + \frac{1}{\tan \theta} = 2$$

squaring both sides

$$\square = 4$$

$$\tan^2 \theta + \square + \frac{1}{\tan^2 \theta} = 4$$

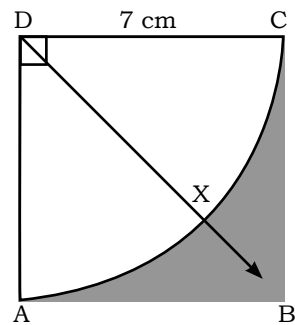
$$\therefore \tan^2 \theta + \frac{1}{\tan^2 \theta} = \square$$

3. In figure, side of square ABCD is 7 cm.
 With centre D and radius DA,
 sector D – AXC is drawn.
 Fill in the following boxes properly and find
 out the area of the shaded region.

$$\begin{aligned} \text{Area of a square} &= \square \\ &= \square \\ &= 49 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of sector (D – AXC)} &= \square \\ &= \frac{\square}{360} \times \frac{22}{7} \times \square \\ &= 38.5 \text{ cm}^2 \end{aligned}$$

$$\text{A (shaded region)} = A \square - A \square$$



$$= \boxed{} \text{ cm}^2 - \boxed{} \text{ cm}^2$$

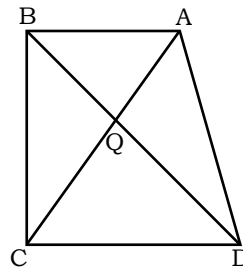
$$= \boxed{} \text{ cm}^2$$

Q.3. (B) Solve the following : (Any 2)**4**

- In $\triangle ABC$, $DE \parallel BC$. If $DB = 5.4$ cm, $AD = 1.8$ cm, $EC = 7.2$ cm then find AE .
- If $\sin \theta = \frac{7}{25}$ then find $\cos \theta$ and $\tan \theta$.
- The length, breadth and height of an oil can are 20 cm, 20 cm and 30 cm respectively. How much oil will it contain?
(1 litre = 1000 cm^3)

Q.4. Solve the following : (Any 3)**9**

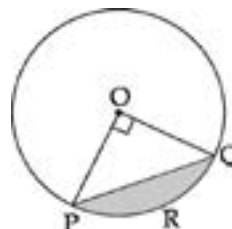
- Diagonals of a quadrilateral ABCD intersect in point Q. If $2QA = QC$, $2QB = QD$, then prove that $DC = 2AB$.



- Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance 7.3 cm from the centre.

- Prove : $\frac{\tan^3 \theta - 1}{\tan \theta - 1} = \sec^2 \theta + \tan \theta$

- In the adjoining figure, if O is the centre of the circle, PQ is a chord. $\angle POQ = 90^\circ$, area of shaded region is 114 cm^2 , find the radius of the circle ($\pi = 3.14$)



Q.5 Solve the following : (Any 1)**4**

1. Prove : The bisector of an angle of a triangle divides the side opposite to the angle in the ratio of the remaining sides.
2. Construct $\triangle PYQ$ such that $PY = 6.3$ cm, $YQ = 7.2$ cm, $PQ = 5.8$ cm.
If $\frac{YZ}{YQ} = \frac{6}{5}$, then construct $\triangle XYZ$ similar to $\triangle PYQ$.

Q.6 Solve the following : (Any 1)**3**

1. A storm broke a tree and the treetop rested 20 m from the base of the tree, making an angle of 60° with the horizontal. Find the height of the tree.
2. A cylinder bucket of diameter 28 cm and height 20 cm was full of sand. When the sand in the bucket was poured on the ground, the sand got converted into a shape of a cone. If the height of the cone was 14 cm, what was the base area of the cone?

Best Of Luck 