BOARD QUESTION PAPER: July 2019

Maths Part - II

Time: 2 Hours **Max. Marks: 40**

Note:

i. *All* questions are compulsory.

ii. Use of calculator is not allowed.

iii. Figures to the right of questions indicate full marks.

iv. Draw proper figures for answers wherever necessary.

v. The marks of construction should be clear and distinct. Do not erase them.

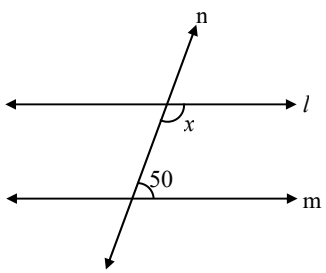
vi. While writing any proof, drawing relevant figure is necessary. Also the proof should be consistent with the figure.

1. (A) Solve the following questions (Any four): **[4]**

i. Point M is the mid-point of segment AB. If AB = 8.6 cm, then find AM.

ii. Write the equations of x-axis and y-axis.

iii.



In the above figure, line l || line m and line n is a transversal. Using the given information find the value of x.

iv. If $\sin\theta = \frac{1}{2}$, then find the value of θ.

v. If the side of a cube is 5 cm, then find its volume.

vi. In Δ DEF, if $\angle$ E = 90°, then find the value of $\angle$ D + $\angle$ F.

(B) Solve the following questions (Any two): **[4]**

i. Draw seg AB = 6.8 cm and draw perpendicular bisector of it.

ii. If Δ ABC ~ Δ DEF, then write the corresponding congruent angles and also write the ratio of corresponding sides.

iii. Perpendicular height of a cone is 12 cm and its slant height is 13 cm. Find the radius of the base of cone.

2. (A) Choose the correct alternative: **[4]**

i. In right-angled triangle PQR, if hypotenuse PR = 12 and PQ = 6, then what is the measure of $\angle$ P ?

(A) 30° (B) 60° (C) 90° (D) 45°

ii. If Δ ABC ~ Δ PQR and 4A (Δ ABC) = 25 A(Δ PQR), then AB : PQ = ?

(A) 4 : 25 (B) 2 : 5 (C) 5 : 2 (D) 25 : 4

iii. If the points, A, B, C are non-collinear points, then how many circles can be drawn which passes through points A, B and C ?

(A) two (B) three (C) one (D) infinite

iv. $\sin\theta \times \operatorname{cosec}\theta = ?$

(A) $\sqrt{2}$ (B) $\frac{1}{2}$ (C) 0 (D) 1

(B) Solve the following questions (Any two): **[4]**

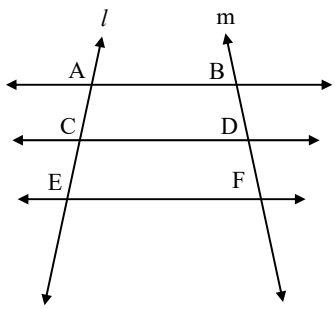
i. Construct a tangent to a circle with centre O and radius 3.5 cm at a point P on it.

ii. Find the slope of the line passing through the points A(4 , 7) and B (2, 3).

iii. If the length of an arc of sector of a circle is 20 cm and if radius is 7 cm, find the area of the sector.

3. (A) Complete the following activities (Any two): **[4]**

i.



In the above figure, line AB || line CD || line EF , line *l* and line *m* are its transversals. If AC = 6, CE = 9. BD = 8, then complete the following activity to find DF.

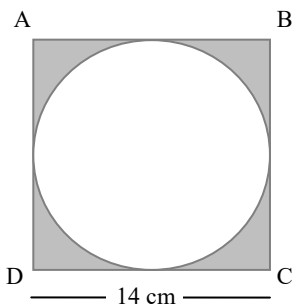
Activity:

$\frac{AC}{\square} = \frac{\square}{DF}$ (Property of three parallel lines and their transversal)

$\therefore \frac{6}{9} = \frac{\square}{DF}$

$\therefore$ DF = $\square$

ii.



A circle is inscribed in square ABCD of side 14 cm. Complete the following activity to find the area of shaded portion.

Activity:

Area of square ABCD = $\square$

$= 14^2$

$= 196\ cm^2$

Area of circle = πr^2

$= \frac{22}{7} \times 7^2$

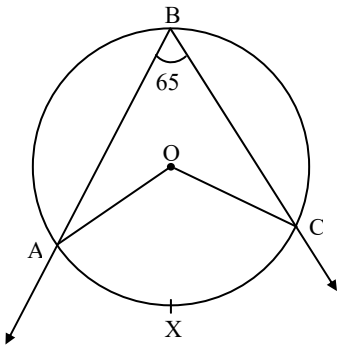
$= \square$ cm^2

Area of shaded portion = Area of square ABCD – Area of circle

$= 196 - \square$

$= \square$ cm^2

iii. In the following figure, O is the centre of the circle. ∠ ABC is inscribed in arc ABC and ∠ ABC = 65°. Complete the following activity to find the measure of ∠ AOC.



∠ ABC = $\frac{1}{2}$ m $\square$ (Inscribed angle theorem)

$\square$ **× 2 =** m(arc AXC)

m(arc AXC) = $\square$

∠ AOC = m(arc AXC) (Definition of measure of an arc)

∠ AOC = $\square$

(B) Solve the following questions (Any two): **[4]**

i. Find the side and perimeter of a square whose diagonal is $13\sqrt{2}$ cm.

ii. Find the co-ordinates of the centroid of the Δ PQR, whose vertices are P(3, –5), Q(4, 3) and R(11, –4)

iii. If $\cos\theta = \frac{5}{13}$, then find $\sin\theta$.

4. Solve the following questions (Any three): **[9]**

i. Verify that the points A(–2, 2), B(2, 2) and C(2, 7) are the vertices of right-angled triangle.

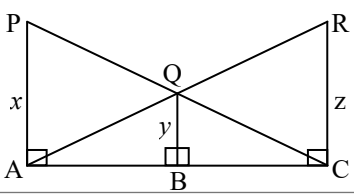
ii. Prove that: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$

iii. In Δ ABC, seg AP is a median. If BC = 18, $AB^2 + AC^2 = 260$, then find the length of AP.

iv. Δ ABC ~ Δ LMN. In Δ ABC, AB = 5.5 cm, BC = 6 cm, CA = 4.5 cm. If MN = 4.8 cm, then construct Δ ABC and Δ LMN.

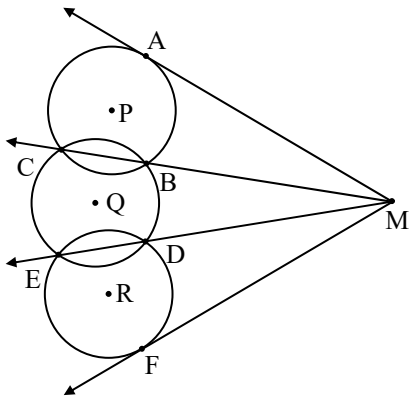
5. Solve the following questions (Any one): **[4]**

i.



In the above figure, seg PA, seg QB and RC are perpendicular to seg AC. From the information given in the figure, prove that: $\frac{1}{x}+\frac{1}{z}=\frac{1}{y}$.

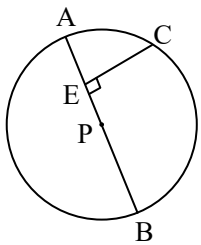
ii.



In the above figure, the circles with P, Q and R intersect at points B, C, D and E as shown. Lines CB and ED intersect in point M. Lines drawn from point M touch the circles at points A and F. Prove that MA = MF.

6. Solve the following questions (Any one): **[3]**

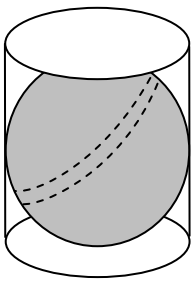
i.



In the above figure, seg AB is a diameter of a circle with centre P. C is any point on the circle. seg CE ⊥ seg AB. Prove that CE is the geometric mean of AE and EB. Write the proof with the help of following steps:

a. Draw ray CE. It intersects the circle at D.
b. Show that CE = ED.
c. Write the result using theorem of intersection of chords inside a circle.
d. Using CE = ED, complete the proof.

ii.



In the above figure, a sphere is placed in a cylinder. It touches the top, bottom and the curved surface of the cylinder. If radius of the base of cylinder is '*r*', write the answer of the following questions.

a. What is the height of the cylinder in terms of '*r*'?
b. What is the ratio of the curved surface area of the cylinder and the surface area of the sphere?
c. What is the ratio of volumes of the cylinder and of the sphere?