MATHEMATICS (PART–II)
MODEL QUESTION PAPER

(With Full Solution and Marking Scheme)

Time : 2 Hours] **[Total Marks : 40**

Note : *(i) All questions are compulsory.*

*(ii) Use of calculator is **not** allowed.*

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQ's [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.

(v) For every MCQ, the correct alternative (A), (B), (C) or (D) in front of subquestion number is to be written as an answer.

(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : **4**

(i) In $\triangle ABC \sim \triangle DEF$ and $\angle A = 45°$, $\angle E = 30°$, then $\angle C =$ ....

(A) 85° (B) 90° (C) 75° (D) 105°

(ii) In a right angled triangle, if the sum of the squares of the sides making right angle is 169, then what is the length of the hypotenuse?

(A) 15 (B) 13 (C) 5 (D) 12

(iii) Two circles intersect each other such that each circle passes through the centre of the other. If the distance between their centres is 10 cm, what is the radius of each circle?

(A) 20 cm (B) 10 cm (C) 12 cm (D) 5 cm

(iv) seg AB is a parallel to Y-axis and coordinates of point A are (1, 3), then coordinates of point B can be ....

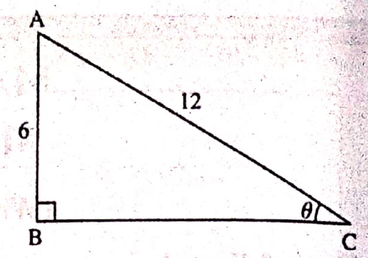
(A) (3, 1) (B) (5, 3) (C) (3, 0) (D) (1, –3)

Q. 1. (B) Solve the following subquestions : **4**

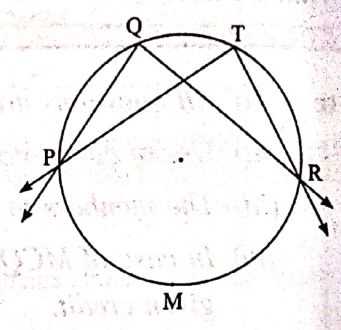
(i) Write the coordinates of the point of intersection of X-axis and line having equation $x = 2$.

(ii) If $\sin \alpha = \cos \theta$, then find the value of $\alpha + \theta$.

(iii) In the figure, $AB = 6$, $AC = 12$ and $\angle ABC = 90°$, then find the value of θ. Justify your answer.



(iv) Observe the figure, $\angle PQR$ and $\angle PTR$ are inscribed in the arc PQR and they intercept arc PMR. If $\angle PQR = 85°$, then find the measure of $\angle PTR$. Give reason.



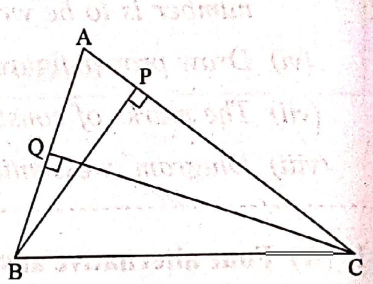
Q. 2. (A) Complete *any two* of the following activities : **4**

(i) In the adjoining figure,

BP $\perp$ AC, CQ $\perp$ AB,

A–P–C, A–Q–B.

Complete the following activity to prove $\triangle APB \sim \triangle AQC$.



In $\triangle APB$ and $\triangle AQC$,

$\angle APB = \square°$. ... (1)

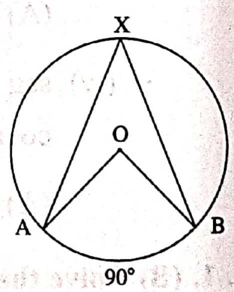
$\angle AQC = \square°$. ... (2)

$\therefore \angle APB \cong \angle AQC$ ... [From (1) and (2)]

$\angle PAB \cong \angle QAC$ ... ($\square$)

$\therefore \triangle APB \sim \triangle AQC$ ... ($\square$)

(ii) In the figure, m(arc AB) $= 90°$. Observe the figure and complete the following table.



Type of an angle	Name of an angle	Measure of an angle
Central angle	$\square$	$\square$
Inscribed angle	$\square$	$\square$

(iii) Complete the following activity to find the value of $6\tan^2\theta - \frac{6}{\cos^2\theta}$.

$$6\tan^2\theta - \frac{6}{\cos^2\theta}$$

$$= 6\left(\tan^2\theta - \frac{1}{\boxed{}}\right)$$

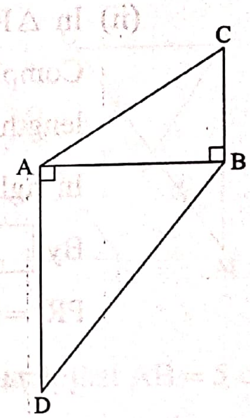
$$= 6(\tan^2\theta - \boxed{}) \quad \ldots \left(\sec\theta = \frac{1}{\cos\theta}\right)$$

$$= 6(\boxed{}) \quad \ldots (1 + \tan^2\theta = \sec^2\theta)$$

$$= \boxed{}$$

Q. 2. (B) Solve *any four* of the following subquestions : **8**

(i) In the figure, BC ⊥ AB, AD ⊥ AB, BC = 4, AD = 8, then find $\frac{A(\triangle ABC)}{A(\triangle ADB)}$.

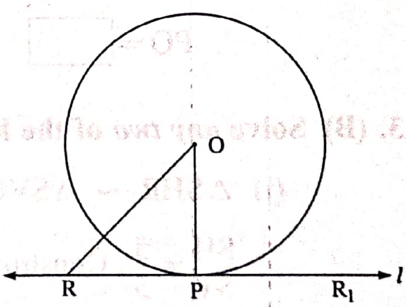


(ii) State with reason whether (12, 13, 5) is a pythagorean triplet or not.

(iii) Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following :

(1) What is $d(O, P) = ?$ Why?

(2) If $d(O, Q) = 8$ cm, where does the point Q lie?



(iv) Find the distance between A(2, 3) and B(4, 1).

(v) Construct a tangent to a circle with centre O and radius 2.7 cm at any point M on it.

Q. 3. (A) Complete *any one* of the following activities : **3**

(i) Complete the following activity to prove that $P(2, -2)$, $Q(7, 3)$, $R(11, -1)$ and $S(6, -6)$ are vertices of a parallelogram.

By distance formula,

Distance between two points $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$PQ = \boxed{}$ ... (1) $\quad QR = \boxed{}$ ... (2)

$RS = \boxed{}$ ... (3) $\quad PS = \boxed{}$ ... (4)

from (1), (2), (3) and (4), we get

$PQ = \boxed{}$ and $QR = \boxed{}$

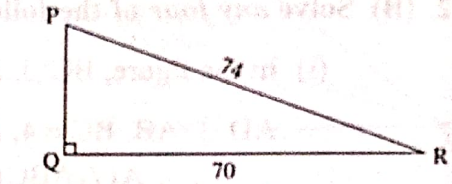
The opposite sides of quadrilateral are equal in length.

So $\square$PQRS is a parallelogram.

... [A quadrilateral is a parallelogram, if its opposite sides are equal]

(ii) In $\triangle PQR$, $\angle PQR = 90°$, $PR = 74$, $QR = 70$.

Complete the following activity to find the length of side PQ.



In right angled $\triangle PQR$,

By $\boxed{}$

$PR^2 = PQ^2 + \boxed{}$

$\therefore 74^2 = PQ^2 + \boxed{}$

$\therefore PQ^2 = 5476 - \boxed{}$

$\therefore PQ^2 = \boxed{}$

$\therefore PQ = \boxed{}$

Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i) $\triangle SHR \sim \triangle SVU$. In $\triangle SHR$, $SH = 4$ cm, $HR = 4$ cm, $SR = 4.8$ cm and $\frac{SH}{SV} = \frac{5}{3}$. Construct $\triangle SVU$.

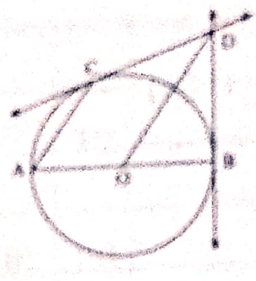
(ii) Prove that, 'Tangent segments drawn from an external point to a circle are congruent.'

(iii) Prove that, $A(1, 2)$; $B(1, 6)$ and $C(1 + 2\sqrt{3}, 4)$ are vertices of an equilateral triangle.

(iv) If $5 \sec\theta - 12 \operatorname{cosec}\theta = 0$, then find the values of $\sec\theta$, $\cos\theta$ and $\sin\theta$.

Q. 4. Solve *any two* of the following subquestions : **8**

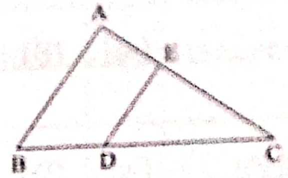
(i) In the figure, O is the centre of the circle. seg AB is the diameter and seg AC is the chord of the circle. Tangent CD is drawn at point C on the circle. Line BD is tangent to the circle at point B. Prove that seg OD $\parallel$ chord AC.



(ii) In the figure, seg DE $\parallel$ side AB.

DC = 2BD, A($\triangle$CDE) = 20 cm^2.

Find A($\square$ABDE).



(iii) Prove that : $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$

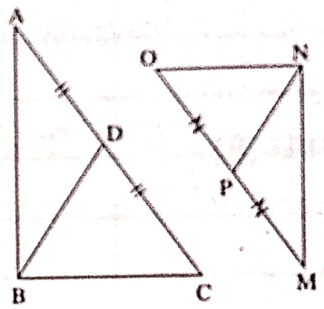
Q. 5. Solve *any one* of the following subquestions : **3**

(i) In the figure, $\triangle$ABC $\sim$ $\triangle$MNO,

D is the midpoint of side AC and P is the midpoint of side MO.

Prove : (1) $\triangle$ABD $\sim$ $\triangle$MNP

(2) $\dfrac{BD}{NP} = \dfrac{AB}{MN}$



(3) Write your conclusion of the result obtained in (ii).

(ii) Draw a circle with centre O and radius 2.5 cm. Draw chord AB such that AB = 5 cm. Take point C on circle such that BC = 3 cm. Draw $\triangle$ABC. Draw tangents to the circle through the points A, B and C. Write the name and type of quadrilateral formed due to intersection of tangents.

MATHEMATICS (PART – II)

QUESTION PAPER 1

Time : 2 Hours] [Total Marks : 40

Note : *(i) All questions are compulsory.*

(ii) Use of calculator is not allowed.

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQ's [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.

(v) For every MCQ, the correct alternative (A), (B), (C) or (D) in front of subquestion number is to be written as an answer.

(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : 4

(i) Find the perimeter of a square, if its diagonal is $10\sqrt{2}$ cm.

(A) 10 cm (B) $40\sqrt{2}$ cm (C) 20 cm (D) 40 cm

(ii) ΔABC and ΔDEF are equilateral triangles. $A(\Delta ABC) : A(\Delta DEF) = 1 : 2$. If $AB = 4$, then what is the length of DE?

(A) $2\sqrt{2}$ (B) 4 (C) 8 (D) $4\sqrt{2}$

(iii) $\sin\theta \cdot \operatorname{cosec}\theta + \sin^2\theta \cdot \operatorname{cosec}^2\theta + \dots\dots\dots + \sin^9\theta \cdot \operatorname{cosec}^9\theta = ?$

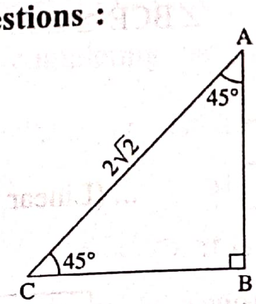
(A) 5 (B) 10 (C) 9 (D) $\frac{1}{9}$

(iv) P $(x, 6)$ is the midpoint of seg AB with A (6, 5) and B $(4, y)$, then $y = ?$

(A) 7 (B) 6 (C) -7 (D) 5

Q. 1. (B) Solve the following subquestions : 4

(i)



In the figure, $\angle ABC = 90°$, $\angle BAC = \angle BCA = 45°$.

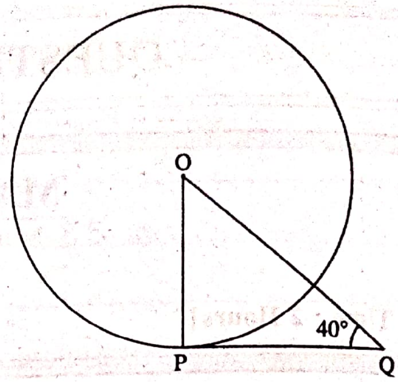
If $AC = 2\sqrt{2}$, then find AB.

(ii) Draw seg AB of length 4.5 cm and construct its perpendicular bisector.

(iii) What is the y coordinate of every point on the X-axis?

(iv) In the figure, seg PQ is tangent and OP is the radius.

$\angle OQP = 40°$. Write the measure of $\angle POQ$.



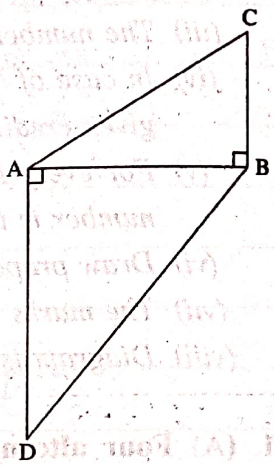
Q. 2. (A) Complete and write *any two* of the following activities : **4**

(i) In the figure,

$BC \perp AB$, $AD \perp AB$, $BC = 4$, $AD = 8$,

then find $\dfrac{A(\triangle ABC)}{A(\triangle ADB)}$

by completing the following activity.



In the figure,

$BC = 4$, $AD = 8$

$\triangle ABC$ and $\triangle ADB$ have same base AB.

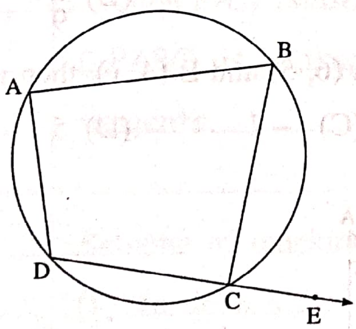
Areas of triangles with same base are proportional to their corresponding $\boxed{\quad}$.

$$\therefore \frac{A(\triangle ABC)}{A(\triangle ADB)} = \frac{BC}{\boxed{\quad}}$$

$$\therefore \frac{A(\triangle ABC)}{A(\triangle ADB)} = \frac{4}{\boxed{\quad}}$$

$$\therefore \frac{A(\triangle ABC)}{A(\triangle ADB)} = \boxed{\frac{\quad}{\quad}}$$

(ii)



In the figure,

$\square ABCD$ is cyclic and D–C–E.

Complete the following activity to prove $\angle BCE \cong \angle BAD$.

$\angle BCE + \angle BCD = \boxed{\quad}$ ... (Linear pair of angles) ... (1)

$\square ABCD$ is cyclic.

$\therefore \angle BAD + \angle BCD = 180°$ ... ($\boxed{\qquad\qquad\qquad}$) ... (2)

$\therefore$ from (1) and (2),

$\angle BCE + \angle BCD = \boxed{\quad} + \angle BCD$

Eliminating $\angle BCD$ from both the sides, we get $\angle BCE = \boxed{\quad}$

(iii) Complete the following activity to find $\cos\theta$, if $\sin\theta = \frac{7}{25}$.

$$\sin^2\theta + \cos^2\theta = \boxed{}$$

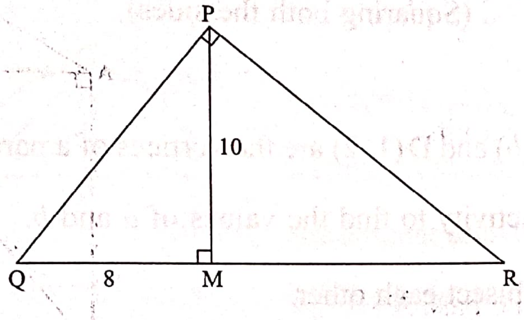
$$\therefore \left(\frac{7}{25}\right)^2 + \cos^2\theta = 1$$

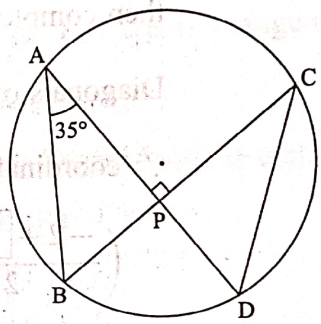
$$\therefore \cos^2\theta = 1 - \frac{49}{\boxed{}}$$

$$\therefore \cos^2\theta = \frac{\boxed{}}{625} \qquad \therefore \cos\theta = \boxed{\frac{}{}}$$

Q. 2. (B) Solve *any four* of the following subquestions : **8**

(i) In the figure, $\angle QPR = 90°$, seg PM $\perp$ seg QR and Q – M – R. PM = 10 and QM = 8. Find the length of seg MR.





(ii) In the figure, chords AD and BC intersect at point P. If $\angle DAB = 35°$, then find the measure of $\angle ADC$.

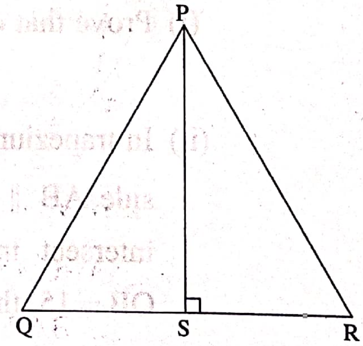
(iii) Draw a circle of radius 3.6 cm. Take any point on it. Draw tangent to the circle through that point.

(iv) Find the distance between the points R(0, -3) and S $\left(0, \frac{5}{2}\right)$.

(v) Prove that $\frac{\sin^2\theta}{\cos\theta} + \cos\theta = \sec\theta$.

Q. 3. (A) Complete and write *any one* of the following activities : **3**

(i) $\triangle PQR$ is an equilateral triangle. seg PS $\perp$ side QR such that Q–S–R. Prove $PS^2 = 3QS^2$ by completing the following activity.



In $\triangle PQS$,

$\angle PSQ = \boxed{}$ ... (Given)

$\angle Q = \boxed{}$ ... (Angle of an equilateral triangle)

$\therefore \angle QPS = 30°$ ... (Remaining angle of $\triangle$ PQS)

$\therefore \triangle PQS$ is a $\boxed{}$ triangle

$PS = \boxed{\frac{\quad}{\quad}}\ PQ$ ... (Side opposite to 60°) ... (1)

and $QS = \boxed{\frac{\quad}{\quad}}\ PQ$ ... (Side opposite to 30°)

$PQ = 2QS$ ... (2)

Substituting value of PQ from (2) in (1),

$PS = \frac{\sqrt{3}}{2} \times 2QS$

$\therefore\ PS = \boxed{}\ QS$

$\therefore\ PS^2 = 3QS^2$ ... (Squaring both the sides)

(ii) If A $(-2, -1)$, B $(a, 0)$, C $(4, b)$ and D $(1, 2)$ are the vertices of a parallelogram, then complete the following activity to find the values of a and b.

Diagonals of a parallelogram bisect each other.

$\therefore$ coordinates of midpoint of AC = coordinates of midpoint of BD.

$$\therefore \left(\frac{-2+\boxed{}}{2}, \frac{-1+b}{2}\right) = \left(\frac{a+1}{2}, \frac{0+\boxed{}}{2}\right)$$

$$\therefore \left(\boxed{}, \frac{b-1}{2}\right) = \left(\frac{a+1}{2}, \boxed{}\right)$$

$$\therefore \frac{a+1}{2} = 1 \text{ and } \frac{b-1}{2} = 2$$

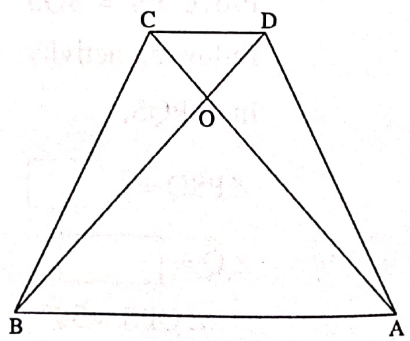
On simplifying, we get,

$a = \boxed{}$ and $b = \boxed{}$.

Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i) Prove that opposite angles of a cyclic quadrilateral are supplementary.

(ii) In trapezium ABCD, side AB ∥ side DC, diagonals AC and BD intersect in point O. If AB = 20, DC = 6, OB = 15, then find OD.



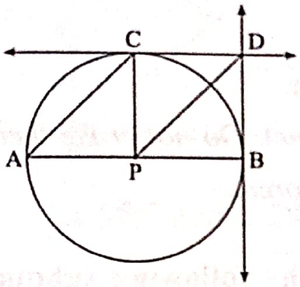
(iii) $\triangle PQR \sim \triangle PMN$. In $\triangle PQR$, PQ = 4 cm, QR = 5 cm and PR = 6 cm. Construct $\triangle PQR$ and $\triangle PMN$ such that $\frac{PR}{PN} = \frac{3}{5}$.

(iv) If $\frac{1}{\sin^2\theta} - \frac{1}{\cos^2\theta} - \frac{1}{\tan^2\theta} - \frac{1}{\cot^2\theta} - \frac{1}{\sec^2\theta} - \frac{1}{\operatorname{cosec}^2\theta} = -3$, then find the value of θ.

Q. 4. Solve *any two* of the following subquestions : **8**

(i) Find the type of the quadrilateral, if points A (−4, −2), B (−3, −7), C (3, −2) and D (2, 3) are joined serially.

(ii)

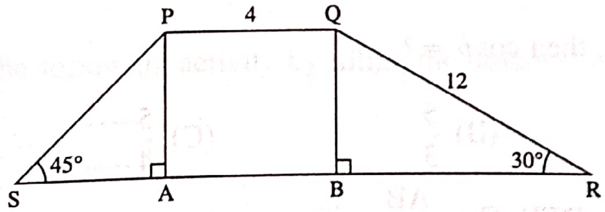


Seg AB is a diameter of a circle with centre P. Seg AC is a chord. A secant through P and parallel to seg AC intersects the tangent drawn at C in D. Prove that line DB is a tangent to the circle.

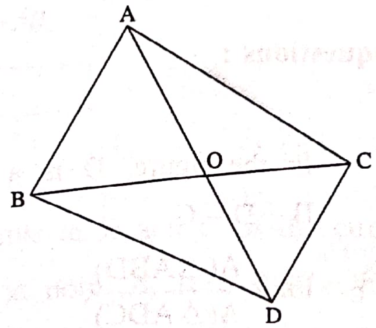
(iii) The diagonals of a quadrilateral intersect each other at right angle. Prove that the sum of the squares of opposite sides is equal.

Q. 5. Solve *any one* of the following subquestions : **3**

(i) In the figure given below, □PQRS is a trapezium. SR ∥ PQ. $\angle S = 45°$, $\angle R = 30°$, PQ = 4, QR = 12, then find the length of SR.



(ii) $\triangle ABC$ and $\triangle DBC$ have common base BC. Prove that $\frac{A(\triangle ABC)}{A(\triangle DBC)} = \frac{AO}{DO}$.



MATHEMATICS (PART – II)

QUESTION PAPER 2

Time : 2 Hours] **[Total Marks : 40**

Note : *(i) All questions are compulsory.*

(ii) Use of calculator is **not** *allowed.*

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(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : **4**

(i) Out of the following, point .... lies to the right of the origin on X-axis.

(A) $(-2, 0)$ (B) $(0, 2)$ (C) $(2, 3)$ (D) $(2, 0)$

(ii) 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) $45°$

(iii) If $\sin\theta = \frac{3}{5}$, then $\cos\theta = ?$

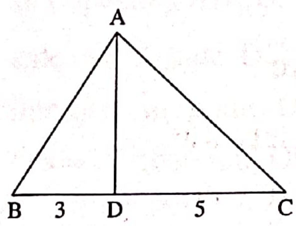
(A) 1 (B) $\frac{5}{3}$ (C) $\frac{5}{4}$ (D) $\frac{4}{5}$

(iv) $\triangle ABC \sim \triangle DEF$. Then $\frac{AB}{DE} = \frac{.....}{EF}$.

(A) AC (B) DF (C) BC (D) None of these

Q. 1. (B) Solve the following subquestions : **4**

(i)

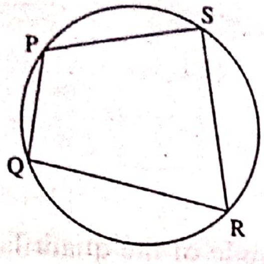


In the figure, D is a point on side BC such that B – D – C.

Find $\frac{A(\triangle ABD)}{A(\triangle ADC)}$.

(ii) Draw seg PQ of length 6 cm. Divide it in the ratio 2 : 3.

(iii)

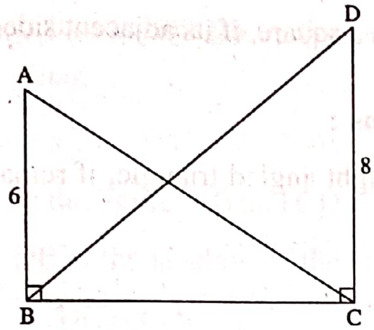


$\square$PQRS is cyclic. If $\angle QPS = 110°$, then find the measure of $\angle QRS$. Give reason.

(iv) If $2 \sin \theta = 5 \cos \theta$, then find the value of $\tan \theta$.

Q. 2. (A) **Complete and write *any two* of the following activities :** **4**

(i)



In the figure, $\angle ABC = \angle DCB = 90°$, $AB = 6$, $DC = 8$. Complete the following activity to find $\frac{A(\Delta ABC)}{A(\Delta DCB)}$.

ΔABC and ΔDCB have same base BC. Their areas are proportional to their corresponding $\boxed{}$.

$\therefore \frac{A(\Delta ABC)}{A(\Delta DCB)} = \frac{AB}{\boxed{}}$

$\therefore \frac{A(\Delta ABC)}{A(\Delta DCB)} = \frac{6}{\boxed{}}$

$\therefore \frac{A(\Delta ABC)}{A(\Delta DCB)} = \boxed{\frac{}{}}$.

(ii) Complete the following activity by filling the boxes :

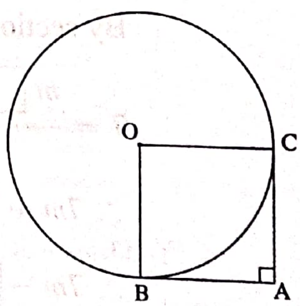
$\sin^2\theta + \cos^2\theta = \boxed{}$

Dividing each term by $\cos^2\theta$

$\frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} = \frac{\boxed{}}{\cos^2\theta}$.

$\therefore \boxed{} + 1 = \boxed{}$

(iii) In the figure, tangents at B and C of the circle with centre O intersect at point A. If $\angle BAC = 90°$, then prove $\square$BACO is a square by completing the following activity.



In $\square$BACO,

$\left.\begin{array}{l}\angle OBA = 90^\circ \\ \angle OCA = 90^\circ\end{array}\right\} \ldots \boxed{\qquad\qquad\qquad}$

$\angle BAC = 90^\circ$ ... (Given)

$\therefore \angle BOC = \boxed{\qquad}$ ... (Remaining angle of the quadrilateral)

$\therefore \square$BACO is $\boxed{\qquad}$ ... (By definition)

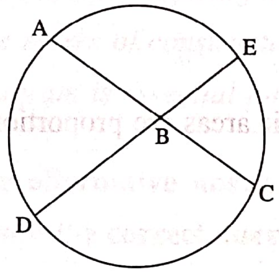
$\therefore AB = AC$ ... $\left(\boxed{\qquad\qquad\qquad}\right)$

$\therefore \square$BACO is a square ... (A rectangle is a square, if its adjacent sides are equal)

Q. 2. (B) Solve *any four* of the following subquestions : **8**

(i) Find the length of the hypotenuse of a right angled triangle, if remaining sides are 9 cm and 12 cm.

(ii)

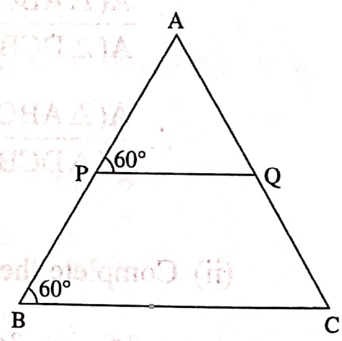


In the figure, chords AC and DE intersect at B. If $\angle ABE = 108^\circ$, $m(\text{arc AE}) = 95^\circ$, find $m(\text{arc DC})$.

(iii) Draw a circle with centre P. Draw an arc AB of measure 100°. Draw tangents to the circle at point A and B.

(iv) Measures of some angles are given in the figure.

Prove that $\dfrac{AP}{PB} = \dfrac{AQ}{QC}$.



(v) Find the distance between the points $A(1, -3)$ and $B(2, -5)$.

Q. 3. (A) Complete and write *any one* of the following activities : **3**

(i) Find the ratio in which point $P(6, 7)$ divides the segment joining $A(8, 9)$ and $B(1, 2)$ by completing the following activity.

Let P divide the seg AB in the ratio $m : n$.

$A(8, 9) = (x_1, y_1)$, $B(1, 2) = (x_2, y_2)$, $P(6, 7) = (x, y)$.

By section formula,

$$7 = \frac{m\boxed{\qquad} + n(9)}{m + n}$$

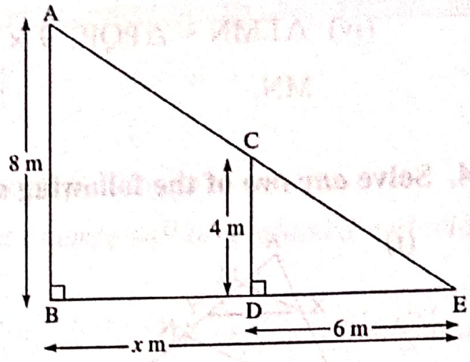
$\therefore 7m + 7n = \boxed{\qquad} + 9n$

$\therefore 7m - \boxed{\qquad} = 9n - \boxed{\qquad}$

$\therefore \boxed{\quad} = 2n$

$\therefore \frac{m}{n} = \boxed{\frac{\quad}{\quad}}$

(ii) Two pillars of height 8 m and 4 m are erected perpendicular to the plane ground. If the length of shadow of smaller pillar is 6 m, then complete the following activity to find the length of shadow of the bigger pillar.



In the figure, AB and CD are two perpendicular pillars, AB = 8 m and CD = 4 m, DE is the shadow of the smaller pillar.

$\therefore$ DE = 6 m

Let the shadow of the bigger pillar BE be x m.

In $\triangle$ABE and $\triangle$CDE,

$\angle AEB \cong \boxed{\quad}$ ... (Common angle)

$\angle ABE \cong \boxed{\quad}$ ... (Each measures 90°)

$\therefore \triangle ABE \sim \triangle CDE$ ... $\left(\boxed{\qquad\qquad}\right)$

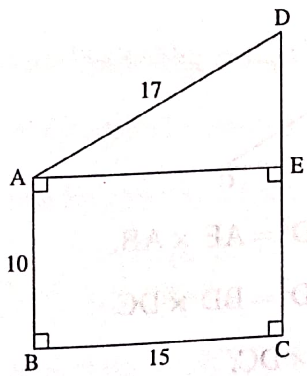
$\therefore \frac{AB}{CD} = \frac{BE}{\boxed{\quad}}$ ... (Corresponding sides of similar triangles are proportional)

$\therefore \frac{8}{4} = \frac{x}{\boxed{\quad}}$

$\therefore x = \boxed{\quad}$ m.

Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i)



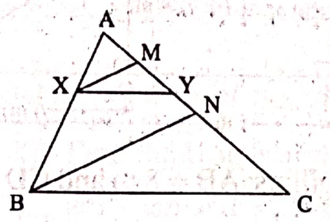
In the figure, AD = 17, AB = 10, BC = 15. $\angle ABC = \angle BCD = 90°$. Seg AE $\perp$ side CD, then find the length of (1) AE (2) DE (3) DC.

(ii) Prove : If two circles touch each other, their point of contact lies on the line joining their centres.

(iii) Draw a circle of radius 4.2 cm and centre O. Mark a point P at a distance of 7 cm from the centre. Draw tangents to the circle from point P.

(iv) $\triangle LMN \sim \triangle PQR$, $9 \times A(\triangle PQR) = 16 \times A(\triangle LMN)$. If $QR = 20$, then find MN.

Q. 4. Solve *any two* of the following subquestions : **8**

(i) 

In $\triangle ABC$, seg XY $\parallel$ side BC. If M and N are the midpoints of seg AY and seg AC respectively. Prove that

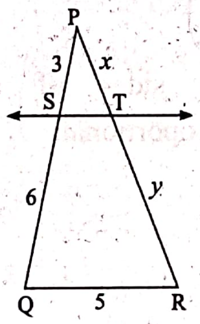
(a) $\triangle AXM \sim \triangle ABN$

(b) seg XM $\parallel$ seg BN.

(ii) Prove that quadrilateral formed by the angle bisectors of a quadrilateral is cyclic.

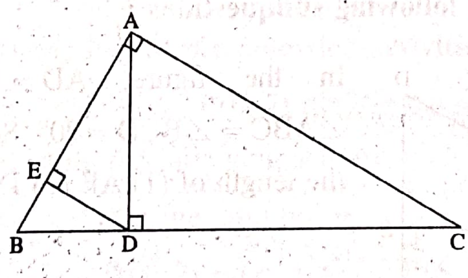
(iii) If A(20, 10), B(0, 20) are given, find the coordinates of the points which divide segment AB into five congruent parts.

Q. 5. Solve *any one* of the following subquestions : **3**

(i) 

In the figure, $PS = 3$, $SQ = 6$, $QR = 5$, $PT = x$ and $TR = y$. Give any two pairs of values of x and y such that line ST $\parallel$ side QR.

(ii) In $\triangle ABC$, $\angle BAC = 90°$, seg AD $\perp$ side BC and seg DE $\perp$ side AB, then



(a) Prove $\triangle ADB \sim \triangle ADE$ and thus prove $AD^2 = AE \times AB$.

(b) Prove $\triangle BDA \sim \triangle ADC$ and thus prove $AD^2 = BD \times DC$.

(c) From (a) and (b), conclude $AE \times AB = BD \times DC$.

MATHEMATICS (PART – II)

QUESTION PAPER 3

Time : 2 Hours] **[Total Marks : 40**

Note : *(i) All questions are compulsory.*

*(ii) Use of calculator is **not** allowed.*

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQ's [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.

(v) For every MCQ, the correct alternative (A), (B), (C) or (D) in front of subquestion number is to be written as an answer.

(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : **4**

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

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

(ii) In $\triangle ABC$, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm, $BC = 6$ cm. Find the measure of $\angle A$.

(A) 30° (B) 60° (C) 90° (D) 45°

(iii) If P is the midpoint of the line segment AB with A $(-4, 2)$ and B $(6, 2)$, then the coordinates of point P are ....

(A) (2, 1) (B) (1, 2) (C) (2, 0) (D) (0, 2)

(iv) If $x+y=\sin\theta$ and $x-y=\cos\theta$, then $x^2+y^2=$ ....

(A) 5 (B) $\frac{1}{2}$ (C) 1 (D) 10

Q. 1. (B) Solve the following subquestions : **4**

(i) What are the coordinates of the origin?

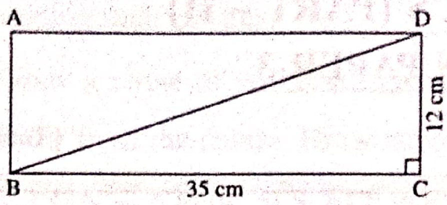
(ii) The heights of $\triangle ABC$ and $\triangle DBC$ are 4 cm and 6 cm respectively.

Find $\dfrac{A(\triangle ABC)}{A(\triangle DBC)}$.

(iii) If $\triangle PQR \sim \triangle XYZ$, then which angle is congruent to $\angle Q$ and which angle is congruent to $\angle Z$?

(iv) What will be the result when each term of $\sin^2\theta + \cos^2\theta = 1$ is divided by $\sin^2\theta$?

Q. 2. (A) Complete and write *any two* of the following activities : **4**

(i) 

Complete the following activity to find the length of diagonal of a rectangle whose length is 35 cm and breadth is 12 cm.

$\square$ABCD is rectangle, BC = 35 cm, CD = 12 cm

$\angle BCD = 90^\circ$ ... (Angle of a rectangle)

$\triangle$BCD is a right angled triangle.

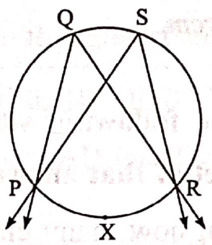
By Pythagoras theorem,

$BD^2 = BC^2 + \boxed{}^2 = 35^2 + \boxed{}^2$

$\therefore\ BD^2 = 1225 + 144$

$\therefore\ BD^2 = \boxed{}$

$\therefore\ BD = \boxed{}$ cm.

(ii) 

In the figure,

$\angle PQR$ and $\angle PSR$ are inscribed in the same arc.

Complete the following activity to prove

$\angle PQR \cong \angle PSR$.

$m\angle PQR = \dfrac{1}{2} m(\text{arc } PXR)$ ... ($\boxed{}$) ... (1)

$m\angle\boxed{} = \dfrac{1}{2} m(\text{arc } PXR)$ ... ($\boxed{}$) ... (2)

$\therefore\ m\angle\boxed{} = m\angle PSR$ ... [From (1) and (2)]

$\therefore\ \angle PQR \cong \angle PSR$.

(iii) Complete the following activity to prove $\dfrac{1}{1+\sin\theta} + \dfrac{1}{1-\sin\theta} = 2\sec^2\theta$.

$$\text{LHS} = \frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta}$$

$$= \frac{1 - \boxed{} + 1 + \boxed{}}{(1+\sin\theta)(1-\sin\theta)}$$

$$= \frac{\boxed{}}{1-\sin^2\theta}$$

$$= \frac{2}{\boxed{}} \quad \text{... [Using identity]}$$

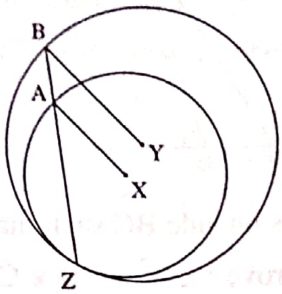
$$= 2\sec^2\theta \quad \text{... [By reciprocal]}$$

$$= \text{RHS}.$$

Q. 2. (B) **Solve *any four* of the following subquestions :** 8

(i) Is (12, 35, 37) a Pythagorean triplet? Give reason.

(ii)

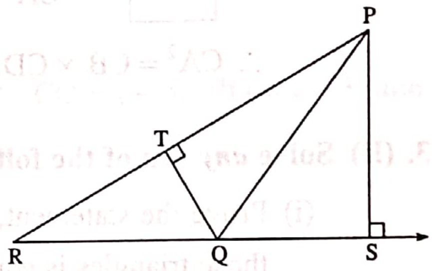


In the figure, circles with centres X and Y touch internally at point Z. Seg BZ is a chord of bigger circle and it intersects smaller circle at point A. Prove that seg AX $\parallel$ seg BY.

(iii) Draw a circle of radius 3.4 cm. Draw a chord MN of length 5.7 cm in it. Construct tangents at M and N to the circle.

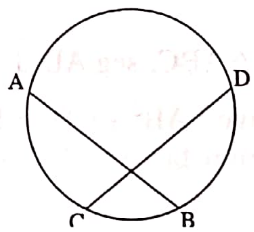
(iv) Find a point on the Y-axis which is equidistant from the points A (6, 5) and B(−4, 3).

(v) In the figure, seg PS $\perp$ seg RQ, seg QT $\perp$ seg PR. If RQ = 6, PS = 6 and PR = 12, then find QT.



Q. 3. (A) **Complete and write *any one* of the following activities :** 3

(i) In the figure, chord AB $\cong$ chord CD. Complete the following activity to prove arc AC $\cong$ arc BD.



Proof :

chord AB $\cong$ chord CD ... (Given)

$\therefore$ arc ACB $\cong$ arc $\boxed{}$ ... (1) ... [Arcs corresponding to congruent chords]

Now, (arc ACB) = m(arc AC) + $\boxed{}$ ... (2)

and (arc CBD) = m(arc CB) + $\boxed{}$ ... (3) } ... (Arc addition property)

$\therefore$ from (1), (2) and (3),

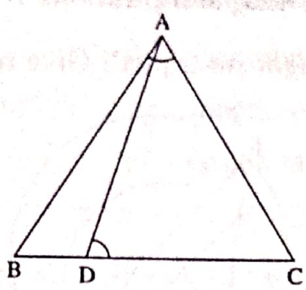
m(arc AC) + m(arc CB) = m(arc CB) + $\boxed{}$

Eliminating m(arc CB) from both the sides, we get,

m(arc AC) = $\boxed{}$

$\therefore$ arc AC $\cong$ $\boxed{}$.

(ii)



In the figure, point D is on side BC such that $\angle BAC \cong \angle ADC$. Complete the following activity to prove : $CA^2 = CB \times CD$.

Proof :

In $\triangle BAC$ and $\triangle ADC$,

$\angle BAC \cong \boxed{}$ ... (Given)

$\angle ACB \cong \angle DCA$ ... $\boxed{}$

$\triangle BAC \sim \triangle ADC$ ... $\boxed{}$

$\therefore \dfrac{CA}{\boxed{}} = \dfrac{\boxed{}}{CA}$ ... $\boxed{}$

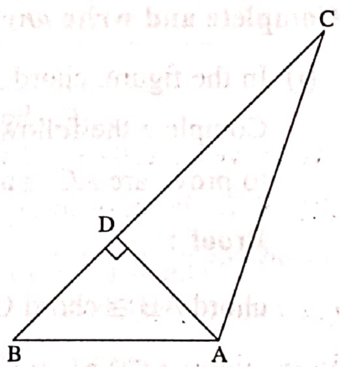
$\therefore CA^2 = CB \times CD$.

Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i) Prove the statement, "When two triangles are similar, the ratio of the areas of those triangles is equal to the ratio of the squares of their corresponding sides."

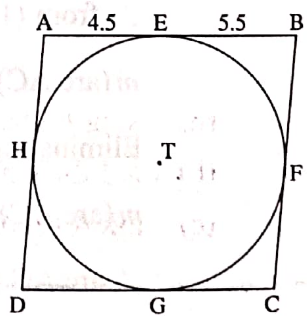
(ii) In $\triangle ABC$, seg AD $\perp$ seg BC.

Prove : $AB^2 + CD^2 = BD^2 + AC^2$.



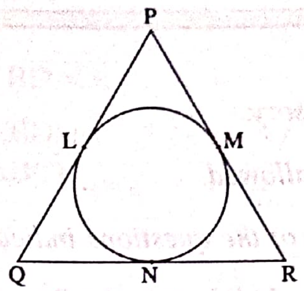
(iii) Show that points A $(-4, -7)$, B $(-1, 2)$, C $(8, 5)$ and D $(5, -4)$ are the vertices of rhombus ABCD.

(iv) In the figure, $\square$ABCD is a parallelogram circumscribed about a circle with centre T. Points E, F, G, H are the points of contact as shown. If $AE = 4.5$, $EB = 5.5$, find AD.



Q. 4. Solve *any two* of the following subquestions : **8**

(i) ΔPQR is an isosceles triangle and its perimeter is 55 cm. Side PQ $\cong$ side PR and length of base QR is 17 cm. As shown in the figure, a circle touches all the three sides of the triangle. Find the length of tangent segments drawn to the circle from point P.

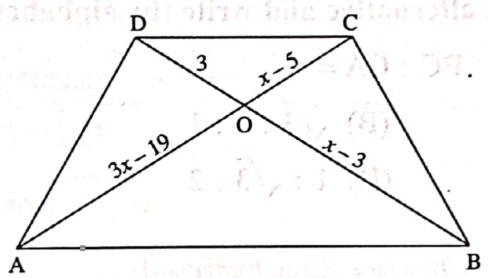


(ii) Draw a circle with centre O and radius 3.2 cm. Take points A and B on the circle such that $\angle AOB = 60°$. Let the bisector of $\angle AOB$ intersect the circle in point K. Draw a circle passing through K such that ray OA and ray OB are tangents to it.

(iii) The line segment AB is divided into five congruent parts at P, Q, R and S such that A–P–Q–R–S–B. If point Q (12, 14) and S (4, 18) are given, find the coordinates of A, P, R and B.

Q. 5. Solve *any one* of the following subquestions : **3**

(i) $\square$ABCD is a trapezium. CD $\parallel$ AB. If $DO = 3$, $CO = x - 5$, $BO = x - 3$ and $AO = 3x - 19$, then answer the following questions.

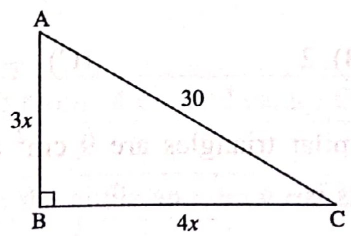


(a) Prove $\Delta AOB \sim \Delta COD$.

(b) Write the corresponding sides of ΔAOB and ΔCOD and frame an equation involving x.

(c) Find the value of x.

(ii) In the figure, $\angle ABC = 90°$, $AB = 3x$, $BC = 4x$ and $AC = 30$, then



(a) Using Pythagoras theorem, determine the value of x.

(b) Find the length of segments AB and BC.

(c) Find A (ΔABC).

MATHEMATICS (PART – II)

QUESTION PAPER 4

Time : 2 Hours] **[Total Marks : 40**

Note : *(i) All questions are compulsory.*

(ii) Use of calculator is not allowed.

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQ's [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.

(v) For every MCQ, the correct alternative (A), (B), (C) or (D) in front of subquestion number is to be written as an answer.

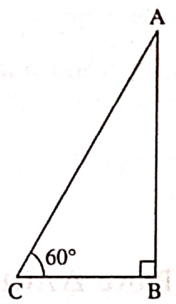
(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : **4**

(i) In $\triangle ABC$, AB : BC : CA = ...



(A) $\sqrt{3} : 1 : 2$ (B) $\sqrt{3} : 2 : 1$

(C) $1 : 2 : \sqrt{3}$ (D) $1 : \sqrt{3} : 2$

(ii) The distance between the point $(-6, 8)$ and the origin is ....

(A) 10 (B) 11 (C) 5 (D) 14

(iii) $\dfrac{\sin 75°}{\cos 15°} =$ ....

(A) 0 (B) 2 (C) -1 (D) 1

(iv) The areas of two similar triangles are 9 cm^2 and 16 cm^2. The ratio of their corresponding heights is ....

(A) 9 : 16 (B) 3 : 4 (C) 4 : 3 (D) 16 : 9

Q. 1. (B) Solve the following subquestions : **4**

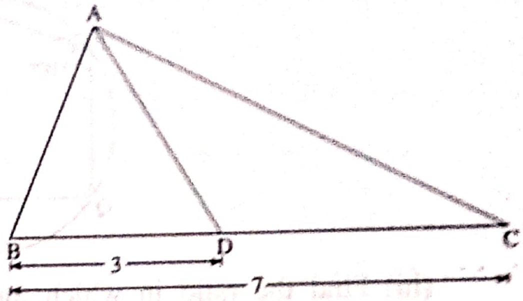
(i) Two circles with radii 3.5 cm and 2.5 cm touch each other internally. Find the distance between their centres.

(ii) $P\left(\frac{a}{2}, 4\right)$ is the midpoint of seg AB joining the points $A(-6, 5)$ and $B(-2, 3)$. Find the value of a.

(iii) In $\triangle ABC$, if $AB^2 = AC^2 + CB^2$, state with reason whether $\triangle ABC$ is a right angled triangle or not.

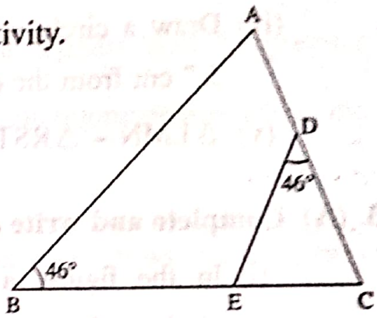
(iv) In the figure, $BC = 7$, $BD = 3$.

Write the ratio $\frac{A(\triangle ABD)}{A(\triangle ABC)}$.



Q. 2. (A) Complete and write *any two* of the following activities : **4**

(i) Observe the figure and complete the following activity.



In $\triangle ABC$ and $\triangle EDC$,

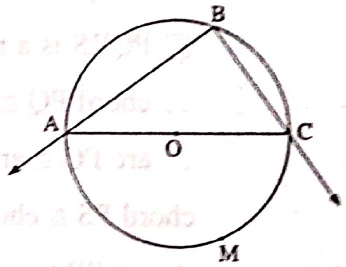
$\angle ABC \cong \angle \boxed{}$ ... (Each measures 46°)

$\angle C \cong \angle C$ ... ($\boxed{}$)

$\therefore \triangle ABC \sim \triangle \boxed{}$

...($\boxed{}$ test for similarity)

(ii) Observe the given figure and complete the following activity to find the measure of an angle in a semicircle.



seg AC is the diameter.

$\therefore m(\text{arc AMC}) = 180°$

$\angle ABC = \frac{1}{2} m(\text{arc } \boxed{})$

... [Inscribed angle theorem]

$\therefore \angle ABC = \frac{1}{2} \times \boxed{}$

$\therefore \angle ABC = \boxed{}$

$\therefore$ angle inscribed in a semicircle is a $\boxed{}$

(iii) Complete the following activity to draw a tangent to a circle at a point on the circle :

Draw a circle of radius 4 cm and centre O

↓

Take a point P on the circle and draw ray OP

↓

Draw a perpendicular line to ray OP at point P

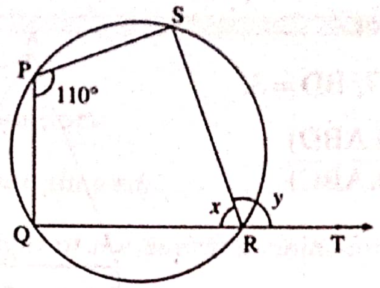
↓

Name the perpendicular line as l,
l is the tangent at point P

Q. 2. (B) Solve *any four* of the following subquestions : **8**

(i) Identify, with reason, whether (24, 70, 74) is a Pythagorean triplet or not.

(ii) □PQRS is cyclic and Q–R–T. If $\angle QPS = 110°$, $\angle QRS = x$ and $\angle SRT = y$, then find the values of x and y.



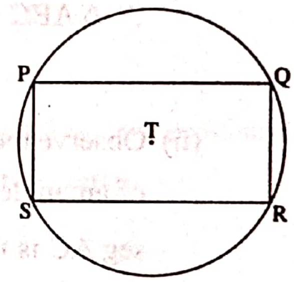
(iii) Find the ratio in which the line segment joining the points A (3, 8) and B (−9, 3) is divided by the Y-axis.

(iv) Draw a circle with centre O and radius 3 cm. Take a point P at a distance 5.7 cm from the centre. Draw tangents to the circle from point P.

(v) $\Delta LMN \sim \Delta RST$, LM = 3, MN = 4, ST = 12, find RS.

Q. 3. (A) Complete and write *any one* of the following activities : **3**

(i) In the figure, a rectangle PQRS is inscribed in a circle with centre T. Complete the following activity to prove arc PQ ≅ arc SR, arc SP ≅ arc QR and arc SPQ ≅ arc PQR.



□ PQRS is a rectangle.

∴ chord PQ ≅ chord SR ... (Opposite sides of a rectangle)

∴ arc PQ ≅ arc $\boxed{}$ ... (Arcs corresponding to congruent chords)

chord PS ≅ chord QR ... (Opposite sides of a rectangle)

∴ arc SP ≅ arc $\boxed{}$ ... (Arcs corresponding to congruent chords)

∴ measures of arcs SP and QR are equal.

Now, m(arc SP) + $\boxed{}$ = $\boxed{}$ + m (arc QR)

∴ m(arc SPQ) = $\boxed{}$

∴ arc SPQ ≅ $\boxed{}$

(ii) Complete the following activity to find the length of median AD.

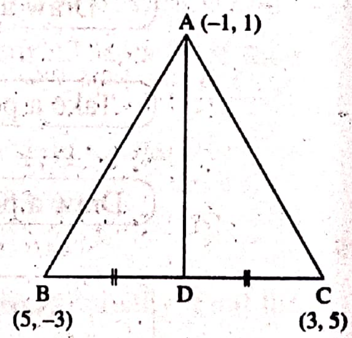
A(−1, 1), B(5, −3), C(3, 5)

Let $D(x_1, y_1)$

By midpoint formula,

$x_1 = \dfrac{5+3}{2}$ $\qquad$ $y_1 = \dfrac{-3+5}{2}$

$\therefore x_1 = \boxed{}$ $\qquad$ $\therefore y_1 = \boxed{}$



By distance formula,

$$AD = \sqrt{\left[4 - \boxed{}\right]^2 + (1-1)^2}$$

$$\therefore\ AD = \sqrt{\boxed{}^2 + 0^2}$$

$$\therefore\ AD = \sqrt{\boxed{}}$$

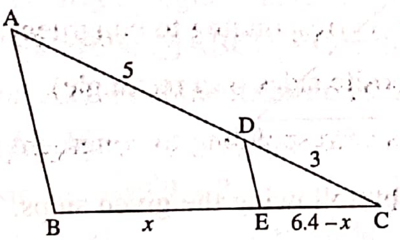
$$\therefore\ AD = \boxed{}$$

Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i) Prove : 'In a right angled triangle, the perpendicular segment to the hypotenuse from the opposite vertex, is the geometric mean of the segments into which the hypotenuse is divided.'

(ii) □ MRPN is cyclic, $\angle R = (5x - 13)^\circ$, $\angle N = (4x + 4)^\circ$. Find the measures of $\angle R$ and $\angle N$.

(iii) $\triangle PSE \sim \triangle TSV$. In $\triangle PSE$, PS = 4.4 cm, SE = 5.1 cm, PE = 5.5 cm and $\frac{PS}{TS} = \frac{5}{3}$. Construct $\triangle PSE$ and $\triangle TSV$.

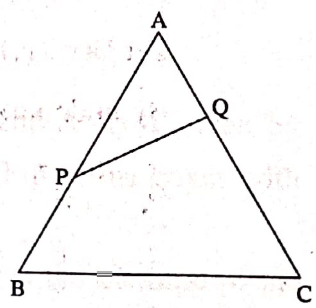
(iv) 

In the figure, A–D–C and B–E–C. seg DE ∥ side AB. If AD = 5, DC = 3, BC = 6.4, then find BE and EC.

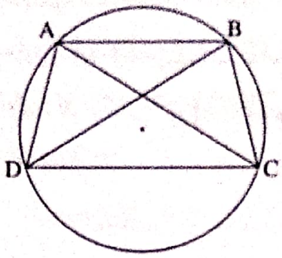
Q. 4. Solve *any two* of the following subquestions : **8**

(i) A line cuts two sides AB and AC of $\triangle ABC$ in points P and Q.

Prove : $\frac{A(\triangle APQ)}{A(\triangle ABC)} = \frac{AP \times AQ}{AB \times AC}$.



(ii)



The diagonals of cyclic quadrilateral ABCD are congruent. Show that AD = BC and seg AB ∥ seg CD.

(iii) $\triangle ABC$ is an equilateral triangle. Point P is on base BC such that $PC = \frac{1}{3}BC$. If AB = 12 cm, find AP.

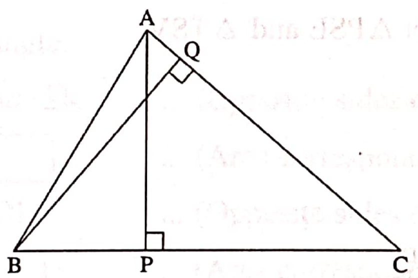
Q. 5. Solve *any one* of the following subquestions : **3**

(i) In $\triangle ABC$, $AP \perp BC$, $BQ \perp AC$, B–P–C and A–Q–C, then

(1) Prove : $\triangle CPA \sim \triangle CQB$.

(2) Write the proportionality of the corresponding sides of $\triangle CPA$ and $\triangle CQB$.

(3) If AP = 7, BQ = 8, BC = 12, then find AC.



(ii) Prove : $\cot^2\theta - \tan^2\theta = \operatorname{cosec}^2\theta - \sec^2\theta$ by following the given steps.

(a) Consider LHS and write the square relation of $\cot^2\theta$ and $\tan^2\theta$.

(b) Simplify and prove that it is equal to RHS.

MATHEMATICS (PART – II)

QUESTION PAPER 5

Time : 2 Hours] **[Total Marks : 40**

Note : *(i) All questions are compulsory.*

(ii) Use of calculator is not allowed.

(iii) The numbers to the right of the questions indicate full marks.

(iv) In case of MCQ's [Q. No. 1(A)], only the first attempt will be evaluated and will be given credit.

(v) For every MCQ, the correct alternative (A), (B), (C) or (D) in front of subquestion number is to be written as an answer.

(vi) Draw proper figures for answers wherever necessary.

(vii) The marks of construction should be clear and distinct. Do not erase them.

(viii) Diagram is essential for writing the proof of the theorem.

Q. 1. (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative and write the alphabet of that answer : **4**

(i) Two triangles are similar. Length of the sides of one triangle are 3, 5 and 7 respectively. If the length of largest side of second triangle is 21, then the length of it's smaller side is ....

(A) 9 (B) 15 (C) 6 (D) 10

(ii) If a, b, c are sides of a triangle and $a^2+b^2=c^2$, name the type of triangle.

(A) Obtuse angled triangle (B) Acute angled triangle

(C) Right angled triangle (D) Equilateral triangle

(iii) In a cyclic □ABCD, twice the measure of $\angle A$ is equal to thrice the measure of $\angle C$. Find the measure of $\angle C$.

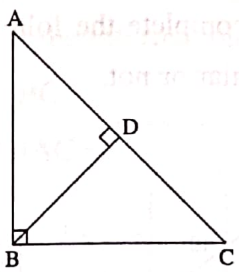
(A) 36° (B) 72° (C) 90° (D) 108°

(iv) $\sin^2\theta+\cos^2\theta=?$

(A) $\cot^2\theta$ (B) $\tan^2\theta$ (C) 0 (D) 1

Q. 1. (B) Solve the following subquestions : **4**

(i)



In the figure, $\angle ABC=90°$ and seg BD $\perp$ side AC and A–D–C, then by theorem of geometric mean $BD^2=\boxed{}\times\boxed{}$. Fill in the boxes with the correct answers.

(ii) In a circle, the measure of the minor arc is 60°. What is the measure of the corresponding major arc?

(iii) If $\sin\alpha = \cos\beta$, then what is the value of $\alpha + \beta$?

(iv) If $\Delta MNO \sim \Delta PQR$, then write the proportionality of its corresponding sides.

Q. 2. (A) Complete and write *any two* of the following activities : **4**

(i) Complete the following activity to prove that (3, 5, 4) is a Pythagorean triplet.

In a triplet, if the $\boxed{\quad}$ of the largest number is equal to the sum of the squares of the remaining two numbers, then the group of these three numbers is called a Pythagorean triplet.

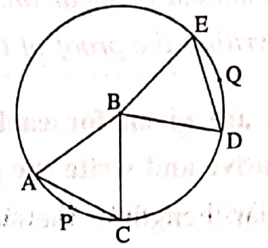
In the numbers (3, 5, 4), the largest number is $\boxed{\quad}$.

$5^2 = \boxed{\quad}$ and $3^2 + \boxed{\quad}^2 = 9 + 16 = 25$.

$\therefore\ 5^2 = 3^2 + 4^2$.

$\therefore$ (3, 5, 4) is a Pythagorean triplet.

(ii)



In a circle with centre B, arc APC $\cong$ arc DQE. Complete the following activity to prove chord AC $\cong$ chord DE.

In ΔABC and ΔDBE,

side AB $\cong$ side DB ... $[\boxed{\quad}]$

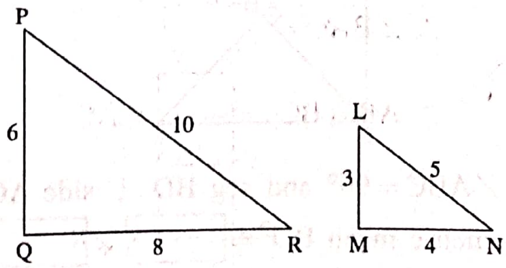
side $\boxed{\quad}$ $\cong$ side BE ... (Radii of the same circle)

$\angle ABC \cong \angle DBE$ ... (Measures of congruent arcs)

$\therefore\ \Delta ABC \cong \Delta DBE$ ... $[\boxed{\quad}$ test$]$

$\therefore$ chord AC $\cong$ chord DE ... $[\boxed{\quad}]$

(iii) Observe the figure and complete the following activity to determine whether the two triangles are similar or not.



In ΔPQR and ΔLMN,

$\dfrac{PQ}{LM} = \dfrac{6}{3} = \boxed{\quad}$

$$\frac{QR}{MN}=\frac{8}{4}=2$$

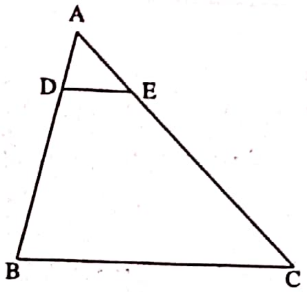
$$\frac{PR}{LN}=\frac{10}{5}=\boxed{\quad}.$$

$\therefore$ ΔPQR is similar to $\boxed{\quad}$.

Reason : $\boxed{\quad}$.

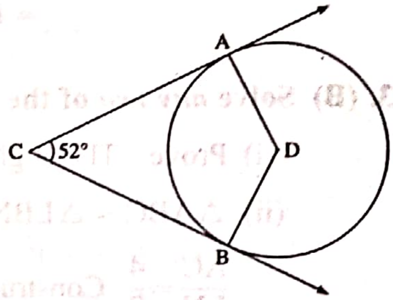
Q. 2. (B) Solve *any four* of the following subquestions : **8**

(i)



In ΔABC, $DE \parallel BC$. If $DB = 5.4$ cm, $AD = 1.8$ cm, $EC = 7.2$ cm, then find AE.

(ii) In the figure, circle with centre D touches the sides of $\angle ACB$ at A and B as shown. If $\angle ACB = 52°$, then find the measure of $\angle ADB$.



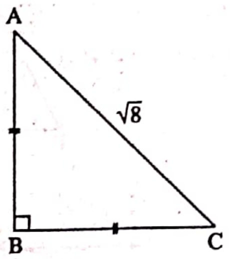
(iii) Draw a circle with centre O and radius 3.9 cm. Draw a tangent to the circle at any point on it without using the centre.

(iv) Find the length of the hypotenuse of a right angled triangle, if the remaining sides are 12 cm and 35 cm.

(v) Find the distance between the points A(2, 3) and B(4, 1).

Q. 3. (A) Complete and write *any one* of the following activities : **3**

(i)



Complete the following activity to find AB and BC with the help of the information given in the figure.

$AB = BC$

$\therefore \angle BAC = \boxed{\quad}$

$\therefore AB = BC = \boxed{\frac{\quad}{\quad}} \times AC$ ... $\left[\text{Reason } \boxed{\quad}\right]$

$= \boxed{\frac{\quad}{\quad}} \times \sqrt{8}$

$= \boxed{\frac{\quad}{\quad}} \times 2\sqrt{2} = \boxed{\quad}$

(ii) Complete the following activity to prove

$\cot \theta + \tan \theta = \operatorname{cosec} \theta - \sec \theta.$

$$\text{LHS} = \cot \theta + \tan \theta$$

$$= \frac{\cos \theta}{\sin \theta} + \frac{\boxed{\quad}}{\cos \theta}$$

$$= \frac{\boxed{\quad} + \boxed{\quad}}{\sin \theta \times \cos \theta}$$

$$= \frac{\boxed{\quad}}{\sin \theta \times \cos \theta}$$

$$= \frac{1}{\boxed{\quad}} \times \frac{1}{\boxed{\quad}}$$

$$= \operatorname{cosec} \theta \times \sec \theta$$

$$= \text{RHS}$$

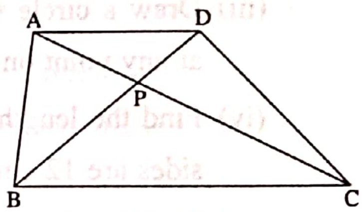
Q. 3. (B) Solve *any two* of the following subquestions : **6**

(i) Prove : The angle inscribed in a semicircle is a right angle.

(ii) $\triangle ABC \sim \triangle LBN$. In $\triangle ABC$, $AB = 5.1$ cm, $\angle B = 40°$, $BC = 4.8$ cm. $\frac{AC}{LN} = \frac{4}{7}$. Construct $\triangle ABC$ and $\triangle LBN$.

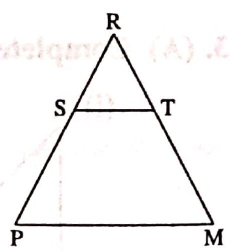
(iii) In $\triangle ABC$, $G(-4, -7)$ is the centroid. If $A(-14, -19)$ and $B(3, 5)$, then find the coordinates of point C.

(iv) In $\square$ ABCD, seg AD $\parallel$ seg BC, diagonal AC and diagonal BD intersect each other in point P. Prove that $\frac{AP}{PD} = \frac{PC}{BP}$.

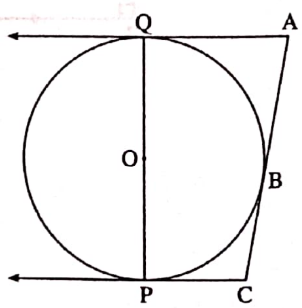


Q. 4. Solve *any two* of the following subquestions : **8**

(i) Point S is on the side PR of $\triangle PMR$ such that $3\ SR = 2\ SP$, seg ST $\parallel$ seg PM. If $A(\triangle PMR) = 50\ \text{cm}^2$, then find (a) $A(\triangle RST)$ (b) $A(\square PMTS)$.



(ii) In the figure, points P, B and Q are points of contact of respective tangents. Line QA is parallel to line PC. If $QA = 7.2$ cm, $PC = 5$ cm, find the radius of the circle.



(iii) Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

Q. 5. Solve *any one* of the following subquestions : **3**

(i) Give one pair of values of x and y such that (x, y) is equidistant from the points $(-1, 8)$ and $(3, 4)$. Justify your steps.

(ii) Using $8^2 - 7^2 = 15$, draw a square of area 15 sq cm.