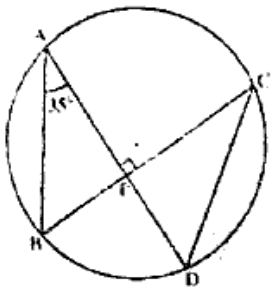
First Semester Exam. 2024 -25
Subject : - Maths II
Set - B

Std :- X | **Marks : 40**

Date :- 25.10.2024 | **Duration : 2 hrs.**

Q1A - Four alternative answers are given for every sub-question. Select the correct alternative and write the alphabet of that answer: (4)

1. In ΔABC, $\angle B = 90°$ and seg BD $\perp$ side AC, A–D–C, then
   A. $BD^2 = DC \times AC$
   B. $BD^2 = AD \times AC$
   C. $BD^2 = AD \times DC$
   D. None of these
2. In the figure, chords AD and BC intersect each other at right angles at a point P. If $\angle DAB = 35°$; then $\angle ADC$ =



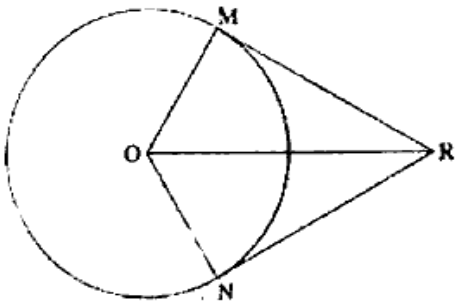
   A. 45°
   B. 55°
   C. 35°
   D. 65°
3. In ΔLMN, if LM = 10 cm and $\angle LNM = 90°$, $\angle LMN = 30°$; then NM =?
   A. 5 cm
   B. $5\sqrt{3}$ cm
   C. $10\sqrt{3}$ cm
   D. $5\sqrt{2}$ cm
4. If two sides of the right angled triangle are 3 and 4, then the length of the third side is
   A. $\sqrt{7}$
   B. 5 or $\sqrt{7}$
   C. none of these
   D. 5

Q1B - Solve the following questions: (4)

1. The ratio of corresponding sides of similar triangles is 3 : 5, then write the ratio of their areas.
2. Observe the triplet (4, 5, 8). State whether it is a Pythagorean triplet or not.
3. In a circle, the measure of the minor arc is 60°. Find the measure of its corresponding major arc.
4. Construct ΔABC such that AB = 4.2 cm, BC = 5.3 cm and AC = 3.7 cm.

Q2A - Complete and write the following activities (Any 2) (4)

1. In the figure, RM and RN are tangent segments of circle with centre O. Complete the following activity to prove that seg OR bisects $\angle MRN$ as well as $\angle MON$.



Activity :

$\angle RMO = \angle RNO =$ [ ] [Reason :]

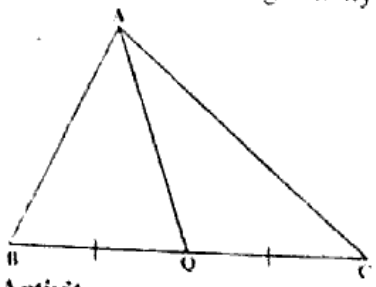
Observe ΔRMO and ΔRNO

$\Delta RMO \cong \Delta RNO$ [Reason :]

$\therefore \angle MRO \cong \square$
$\angle MOR \cong \square$ } (c a c t)

D

2. Complete the following activity to find the length of median AQ on side BC in $\triangle ABC$ if $AC^2 = 122$ and BQ = 5



Activity:

In $\triangle ABC$,

Seg AQ is the median

$\therefore AB^2 + \square^2 = 2AQ^2 + 2\square^2$ ... (Appollonius theorem)

$\therefore 122 = 2AQ^2 + 2\square^2$

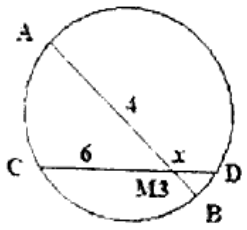
On simplifying we get

$\therefore AQ^2 = \square$

$\therefore AQ = \square$

Length of median AQ is $\square$

3. In the figure, chords AB and CD intersect at point M inside the circle. If AM = 4, MB = 3 CM = 6 and MD = x then complete the following activity to find x.



Activity:

Chords AB and CD intersect a point M inside the circle

$\therefore$ by theorem of internal division of chords,

$\square \times MD = AM \times \square$

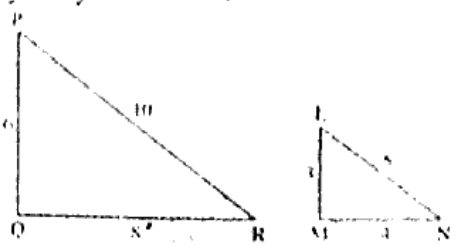
$\therefore \square \times x = 4 \times \square$

$\therefore x = \dfrac{4 \times \square}{\square}$

$\therefore x = \square$

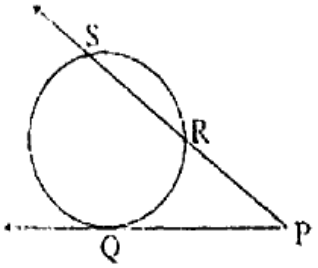
Q2B - Solve the following sub-questions (Any 4) **(8)**

1. Are the triangles in following figures similar?
If yes, by which test?



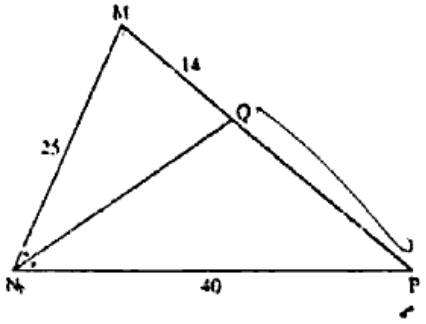
2. Diagonal of a square is 20 cm. Find the length and perimeter of the square.

. In the figure, point Q is the point of contact. If PQ = 12, PR = 8 then find PS.



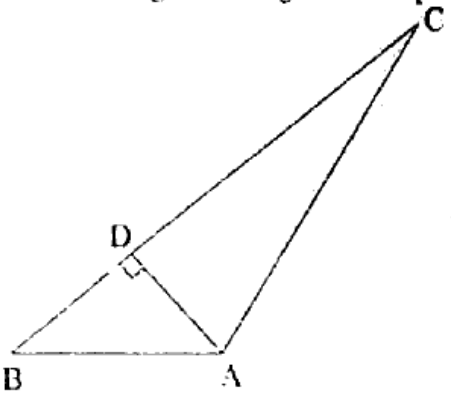
4. Draw any circle. Take any point A on it and construct tangent at A without using the centre of the circle.

5. Find QP using given information in the figure.



Q3A - Complete and write the following activities (Any 1) **(3)**

1. In ΔABC, seg AD ⊥ seg BC. Complete the following activity to prove $AB^2 + CD^2 = BD^2 + AC^2$



In ΔADB,

$\angle ADB = 90°$

∴ by Pythagoras theorem,

$AB^2 = \square + BD^2 \ldots (1)$

In ΔADC,

$\angle ADC = 90°$

∴ by Pythagoras theorem,

$AC^2 = \square + CD^2$

$\therefore CD^2 = \square - \square \ldots (2)$

Adding (1) and (2), we get

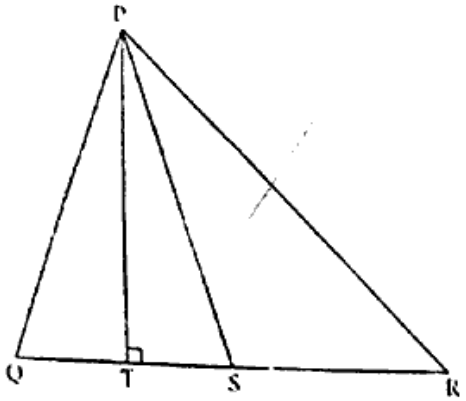
$AB^2 + CD^2 = \square + BD^2 + AC^2 - \square$

$\therefore AB^2 + CD^2 = BD^2 + AC^2$

2. In the figure, seg PS is the median of ΔPQR and PT ⊥ QR. Prove that

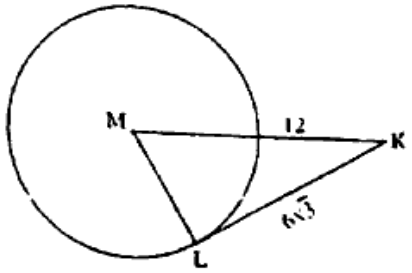
(1) $PR^2 = PS^2 + QR \times ST + \left(\frac{QR}{2}\right)^2$

(2) $PQ^2 = PS^2 - QR \times ST + \left(\frac{QR}{2}\right)^2$

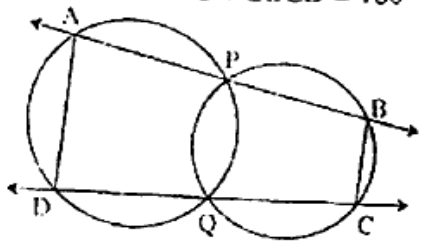


Q3B - Solve the following sub-questions (Any 2) **(6)**

1. In figure, M is the centre of the circle and seg KL is a tangent segment. If MK = 12, $KL = 6\sqrt{3}$ then find.
   (1) Radius of the circle.
   (2) Measures of ∠K and ∠M.

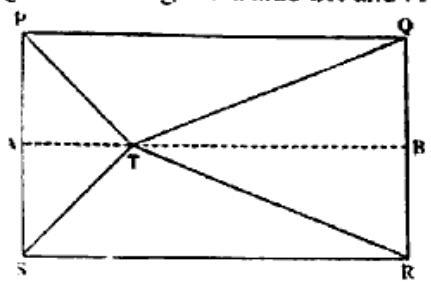


2. Prove that, 'In a right angled triangle, the square of the hypotenuse is equal to the sum of the squares of remaining two sides.'
3. Draw a circle with radius 4.2 cm Construct tangents to the circle from a point at a distance of 7 cm from the centre.
4. Two circles intersect each other at points P and Q. Secants drawn through P and Q intersect the circles at points A, B and D, C.
   Prove that : ∠ADC + ∠BCD = 180°



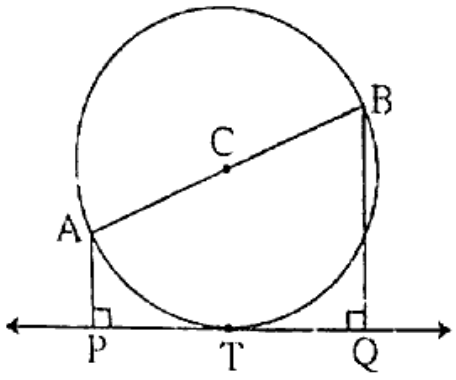
Q4 - Solve the following sub-questions (Any 2) **(8)**

1. In figure, point T is in the interior of rectangle PQRS. Prove that, $TS^2 + TQ^2 = TP^2 + TR^2$ (As shown in the figure, draw seg AB ∥ side SR and A – T – B.)



2. ΔABC ~ ΔLBN. In ΔABC, AB = 5.1 cm, ∠B = 40°, BC = 4.8 cm, $\frac{AC}{LN} = \frac{4}{7}$. Construct ΔABC and ΔLBN.
3. In figure, seg AB is a diameter of a circle with centre C. Line PQ is a tangent, which touches the circle at point T.

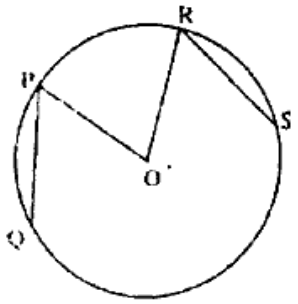
seg AP ⊥ line PQ and seg BQ ⊥ line PQ.
Prove that, seg CP ≅ seg CQ.



(3)

Q5 - Solve the following sub-questions (Any 1)

1. In figure, O is the centre of a circle.
chord PQ ≅ chord RS.
If ∠POR = 70° and (arc RS) = 80°, find–
(1) m(arc PR)
(2) m(arc QS)
(3) m(arc QSR)



2. Seg AM is a median of ΔABC. If AB = 22, AC = 34, BC = 24, find AM.