FAROOQ SATTAR OOMERBHOY HIGH SCHOOL FOR BOYS

I SEMESTER EXAM- 2022

Class: X | Date: 10-10-2022

Sub: Maths-II (Geom) | Marks: 40

1. **(A) Four alternative answers are given for every sub-question. Select the *correct alternative* and write the alphabet of that answer:** 04

   1) If a, b and 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

   2) ΔABC and ΔDEF are equilateral triangles, A (ΔABC) : A (ΔDEF) = 1 : 2
   If AB= 4 then what is the length of DE?
   (A) $2\sqrt{2}$ (B) 4 (C) 8 (D) $4\sqrt{2}$

   3) A circle touches all the sides of a parallelogram. So the parallelogram must be a, ...
   (A) rectangle (B) rhombus (C) square (D) trapezium

   4) 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

(B) Solve the following questions: 04

1) Two circles having radii 3.5 cm and 4.8 cm touch each other internally. Find the distance between their centres.
2) Find the side of a square whose diagonal is 10 cm.
3) The ratio of corresponding sides of similar triangle is 3:5 then find the ratio of their areas.
4) Find the value: $\sin 30° + \cos 60°$

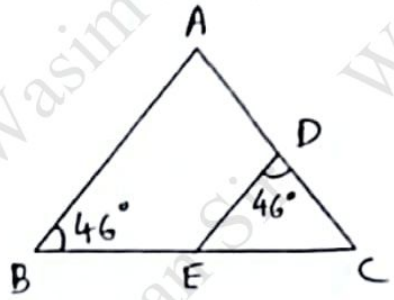
2. **(A) Complete and write the following activities (any two):** 04

   1) Observe the given figure and complete the following activity.

$\angle B \cong$ ☐ (each is of measure 46°)

$\angle C \cong \angle C$ (☐)

$\triangle ABC \sim$ ☐ (By ☐ test of similarity)



2) Complete the following activity by filing the blanks:

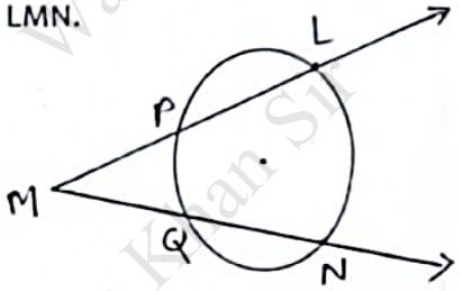
$\sin^2\theta + \cos^2\theta =$ ☐ (Trigonometric Identity)

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

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

$$1 + \cot^2\theta = \square$$

3) In the figure, m(arc LN) = 110°, m(arc PQ) = 50°.
Complete the following activity to find LMN.



$$\angle LMN = \frac{1}{2}[m(\text{arc } LN) - \square]$$

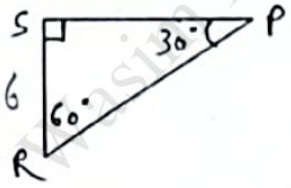
$$= \frac{1}{2}[\square - 50°]$$

$$= \frac{1}{2} \times \square$$

$$\angle LMN = \square$$

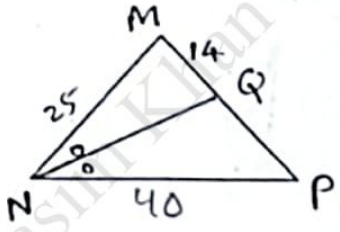
(B) Solve the following sub-questions (any four): **08**

1) See figure. Find RP and PS using the information given in the figure.

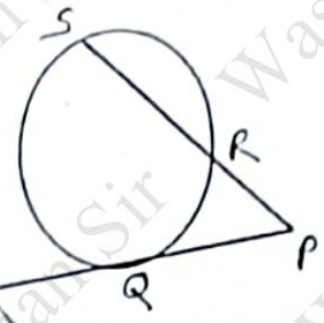


2) If $\sec\theta = 25$, find the value of $\tan\theta$.

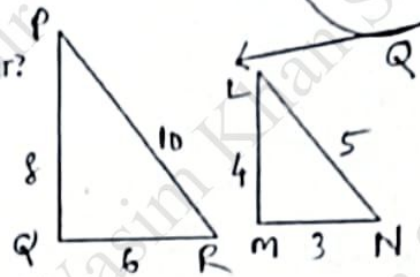
3) Find QP using given information in the figure.



4) in figure, ray PQ touches the circle at point Q.
PQ = 12, PR=8, find PS and RS.



5) Are the triangles in the figure similar?
If yes, by which test?



3. (A) Complete and write the following activities (any one): **03**

1) Observe the given figure and complete the following activity to find AB and BC.

AB= BC ..... □

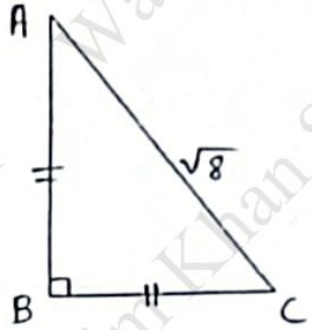
∠ BAC = ∠BCA = □

AB = BC = □ AC

= □ × √8

= □ × 2√2

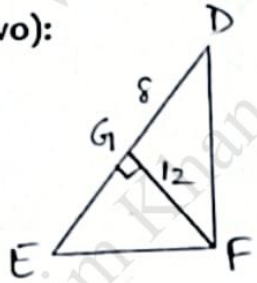
= □



2) In order to prove, ' Ratio of areas of two triangles is equal to the ratio of the products of their bases and corresponding heights.'
   i) Draw a neat labelled figure.
   ii) Write 'Given' and 'To prove'.

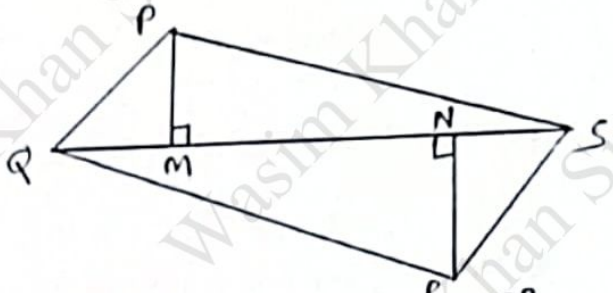
(B) Solve the following sub-questions (any two): **06**

1) In figure, ∠DEF = 90°, FG ⊥ ED,
If GD= 8, FG = 12
Find i) ED ii) FD iii) EF



2) Prove that:
"Opposite angles of a cyclic quadrilateral are supplementary".

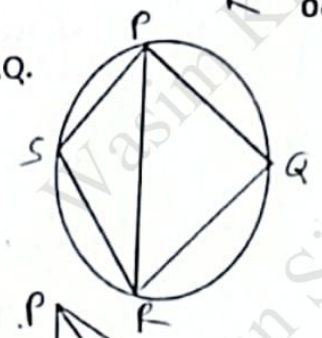
3) From the top of a lighthouse, an observer looking at a ship makes an angle of depression of 60°. If the height of the lighthouse is 90 metre, then find how far the ship is from the lighthouse. $(\sqrt{3} = 1.73)$



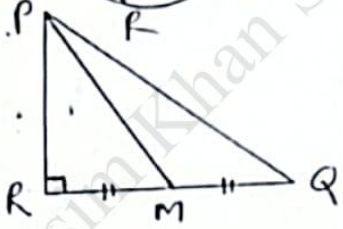
4) In figure, PM = 10 cm
A (Δ PQS) = 100 sq.cm
A (Δ QRS) = 110 sq.cm
then find NR.

4. Solve the following subquestions (any two): 08

1) In figure, PQRS is cyclic. Side PQ $\cong$ side RQ.
$\angle PSR = 110°$, find-
i) measure of $\angle PQR$
ii) m (arc PQR)
iii) m (arc QR)
iv) measure of $\angle PRQ$



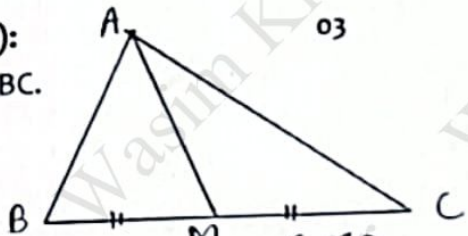
2) In the figure, M is the mid point of QR.
$\angle PRQ = 90°$.
Prove that, $PQ^2 = 4PM^2 - 3PR^2$



3) Prove that:
$\tan A + \cot A = \sin A \cos A$

5. Solve the following subquestions (any one): 03

1) In $\triangle ABC$, point M is the midpoint of side BC.
If, $AB^2 + AC^2 = 290\ cm^2$,
AM = 8 cm, find BC.



2) In figure, seg EF is a diameter and seg DF is a tangent segment.
The radius of the circle is r.
Prove that: $DE \times GE = 4r^2$