

FAROOQ HIGH SCHOOL FOR GIRLS

I Preliminary Examination

Std: X

Subject: Geometry

Marks: 40

Date: 15 / 12 / 2022

Q.1 (A) Four alternative answers are given for each of the following subquestions. Choose the correct alternative. (4)

1) $1 + \tan^2 \theta =$

- A) $\cot^2 \theta$ (B) $\operatorname{cosec}^2 \theta$ (C) $\sec^2 \theta$ (D) $\tan^2 \theta$

2) Two circles of radii 5.5cm and 3.3cm respectively touch each other. What is the distance between their centres.

- (A) 4.4 cm (B) 8.8 cm (C) 2.5 cm (D) 8.8 or 2.2 cm

3) Radius of a sector of a circle is 5cm and length of arc is 10cm then the area of a sector is

- (A) 50 cm^2 (B) 25 cm^2 (C) 75 cm^2 (D) 10 cm^2

4) Out of the following which is Pythagorean Triplet?

- (A) (1,5,10) (B) (3,4,5) (C) (2,2,2) (D) (5,5,2)

Q.1 (B) Solve the following questions. (4)

(1) $\square ABCD$ is cyclic if $\angle B = 110^\circ$ then find the measure of $\angle D$.

(2) If $\tan \theta = \frac{1}{\sqrt{3}}$ then find the value of θ

(3) $\triangle ABC \sim \triangle DEF$. If $AB = 5$ and $DE = 6$, then find the value of $\frac{A(\triangle ABC)}{A(\triangle DEF)}$

(4) Find the diagonal of a square whose side is 10 cm.

Q.2.(A) Complete and write the following activities.(Any two) (4)

(1) Complete and write the following activity .

To find the distance between the points P (6,-6), Q (3,-7). Complete the following activity

Let P (6,-6) = (x_1, y_1) Q (3,-7) = (x_2, y_2)

by distance formula,

$$d(P, Q) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

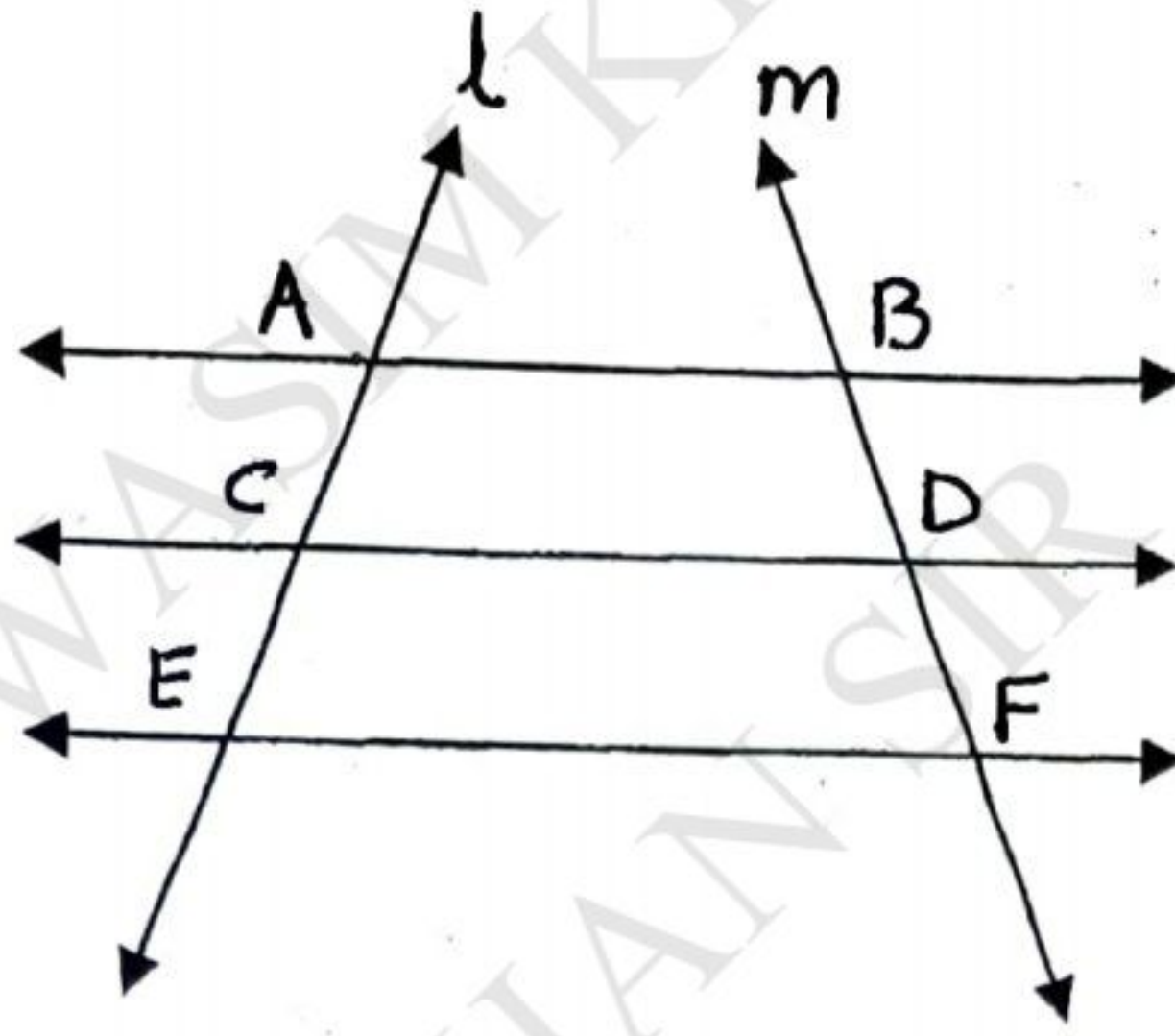
$$= \sqrt{(3 - 6)^2 + (-7 - \square)^2}$$

$$= \sqrt{(\square)^2 + (-1)^2}$$

$$= \sqrt{\square + 1}$$

$$d(P, Q) = \sqrt{\square}$$

(2)



In the above figure, line $AB \parallel$ line $CD \parallel$ line EF , line l and line m are transversal.

$AC = 6$ $CE = 9$ $BD = 8$ then complete the following activity to find DF .

$$\frac{AC}{CE} = \frac{BD}{DF}$$

$$\frac{6}{9} = \frac{8}{DF}$$

$$DF = \boxed{12}$$

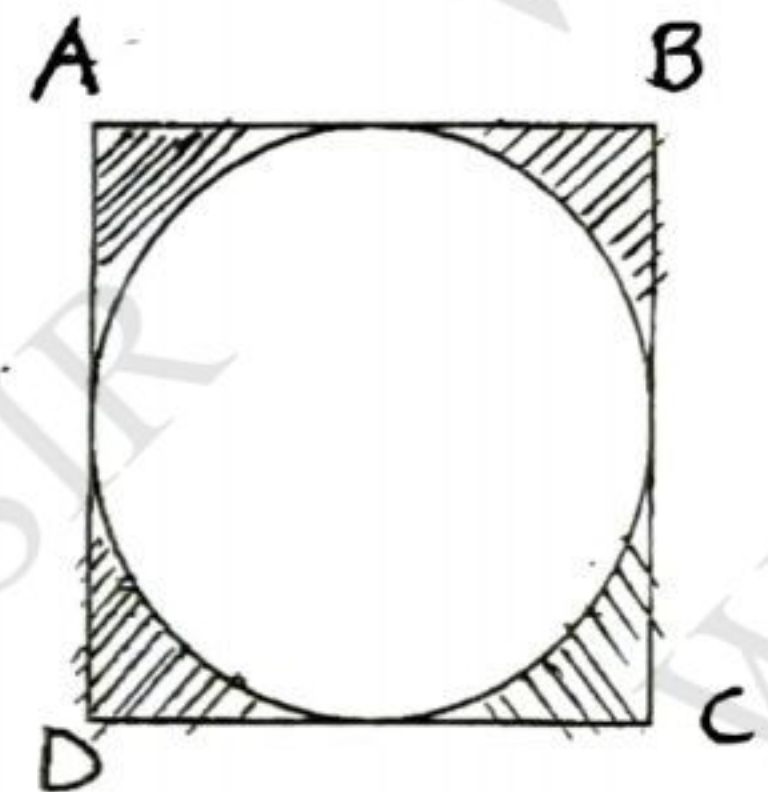
(3) A circle is inscribed in square $ABCD$ of side 14 cm. Complete the area of shaded portion.

Activity:

$$\begin{aligned} \text{Area of square } ABCD &= \boxed{\text{Side}}^2 \\ &= 14^2 \\ &= 196 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Circle} &= \pi r^2 \\ &= \frac{22}{7} \times 7^2 \\ &= \boxed{154} \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of shaded portion} &= \text{Area of square } ABCD - \text{Area of Circle} \\ &= 196 - \boxed{154} \\ &= \boxed{42} \text{ cm}^2 \end{aligned}$$



(B) Solve the following Subquestions. (Any 4 Four)

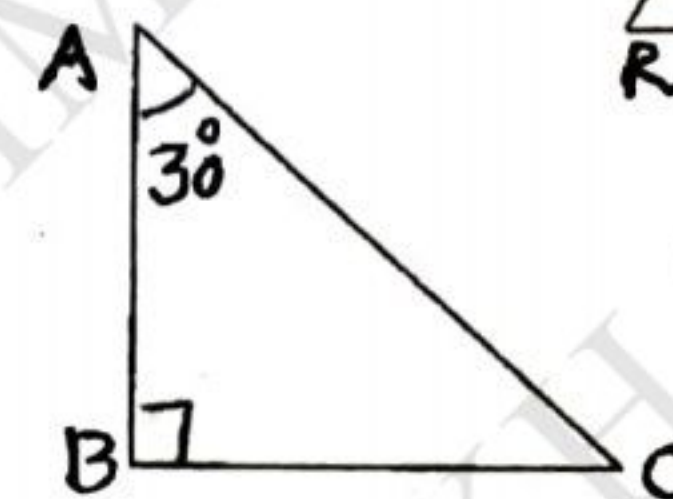
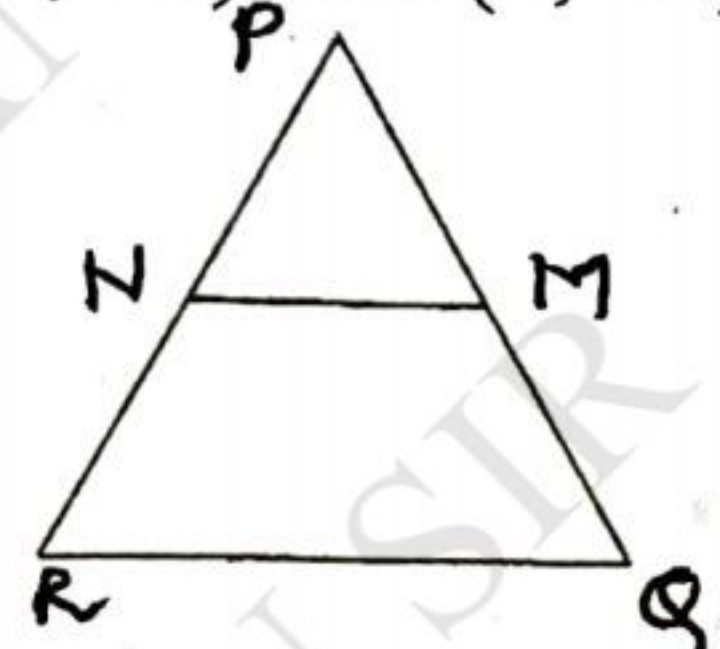
(1) Draw a circle of radius 2.7cm. Draw a tangent to the circle at any point on it.

(2) If $\sin \theta = \frac{7}{25}$ then find the value of $\cos \theta$.

(3) Find the co-ordinates of the midpoint of the segment joining the points (22, 20) and (0, 16).

(4) In $\triangle PQR$ $NM \parallel RQ$ if $PM=15$, $MQ=10$, $NR=8$ then find PN .

(5) In $\triangle ABC$, $\angle B=90^\circ$, $\angle A=30^\circ$, $AC=14$ then find AB and BC .



(8)

Q3) Complete the following activities (Any one)

(3)

(1) If A(6,1) B(8,2) C(9,4) D(7,3) are the vertices of $\square ABCD$ show that $\square ABCD$ is a parallelogram.

Solution:

$$\text{Slope of line} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Slope of line AB} = \frac{2-1}{8-6} = \square \text{ - I}$$

$$\text{Slope of line BC} = \frac{4-2}{9-8} = \square \text{ - II}$$

$$\text{Slope of line CD} = \frac{3-4}{7-9} = \square \text{ - III}$$

$$\text{Slope of line DA} = \frac{3-1}{7-6} = \square \text{ - IV}$$

$$\text{Slope of line AB} = \square \text{ (from I \& III)}$$

$$\text{Line AB} \parallel \text{line CD}$$

$$\text{Slope of line BC} = \square \text{ (from II \& IV)}$$

$$\text{Line BC} \parallel \text{line DA}$$

Both the pairs of opposite sides of the quadrilateral are parallel.

$\square ABCD$ is a parallelogram.

2) In the adjoining figure chord EF \parallel chord GH. Prove that chord EG \cong chord FH.

Fill in the blanks and write the proof.

Given : chord EF \parallel chord GH

To prove : chord EG \cong chord FH

Construction : Draw seg GF.

Proof : $\angle EFG = \angle FGH$

$$\angle EFG = \square$$

$$\square = \square$$

$$m(\text{arc EG}) = \square$$

$$\text{chord EG} \cong \text{chord FH}$$

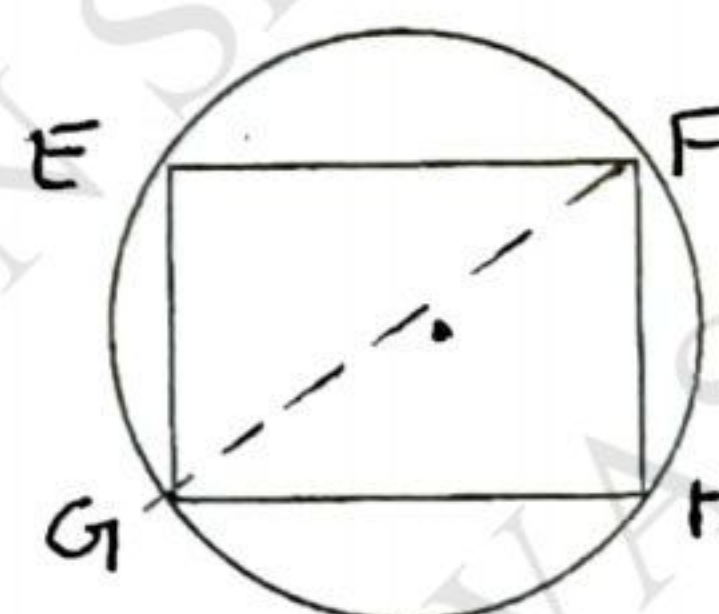
$$\text{----- I } \square$$

$$\text{----- II (Inscribed angle theorem)}$$

$$\text{----- III (Inscribed angle theorem)}$$

$$[\text{from I, II, III}]$$

$$\square$$



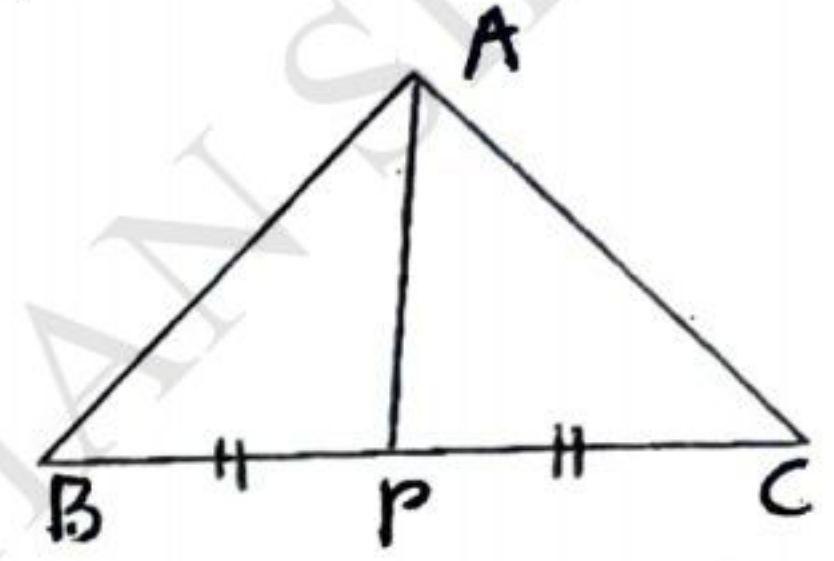
(6)

Q.3 (B) Solve the following sub questions (any two)

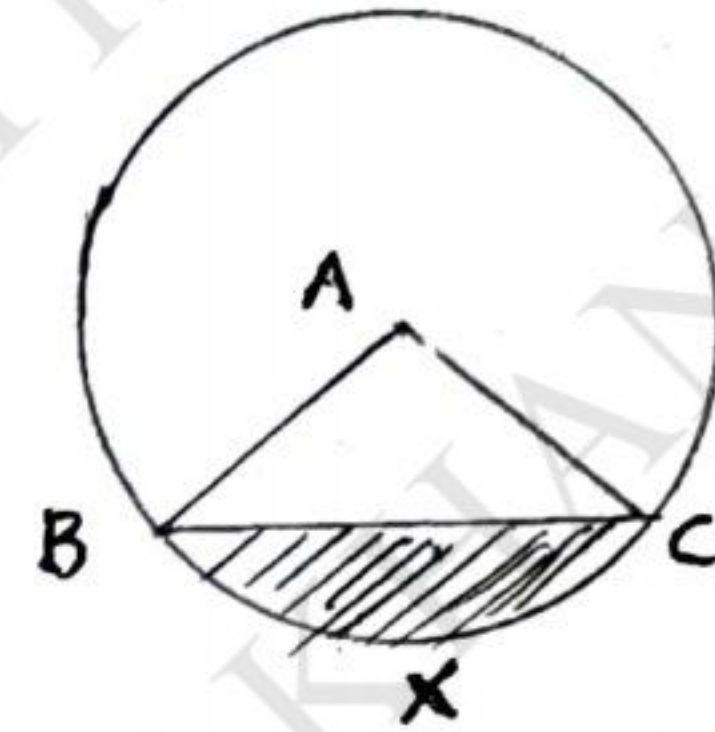
1) Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance 7.3 cm from the center.

2) A person is standing at a distance of 80 m from a church looking at its top. The angle of elevation of 45° . Find the height of the church.

3) In $\triangle ABC$, Seg AP is a median. If $BC=18$, $AB^2+AC^2=260$. Find AP.



4) In figure 'A' is the center of the circle. $\angle BAC=90^\circ$ and $AC=7\sqrt{2}$. Find the area of segment BXC.



(8)

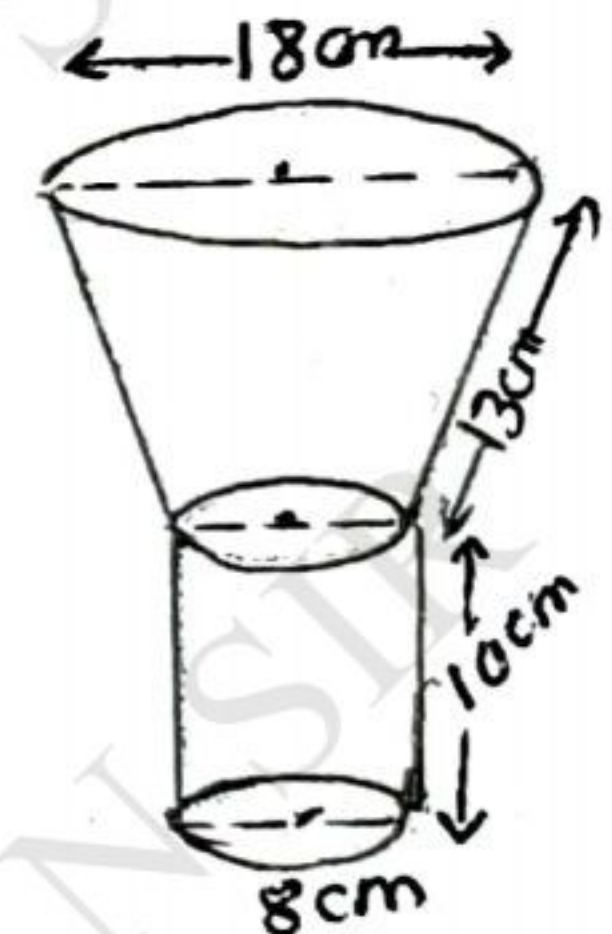
Q.4) Solve the following sub questions (Any two)

1) $\triangle AMT \sim \triangle AHE$.

In $\triangle AMT$, $AM=6.3$ cm, $\angle TAM=50^\circ$, $AT=5.6$ cm, $\frac{AM}{AH} = \frac{7}{5}$. Construct $\triangle AHE$.

2) If A (-14,-10) B(6,-2) is given, find the co-ordinates of the points which divide segment AB into four equal parts.

3) An oil funnel of tin sheet consists of a cylindrical portion 10 cm long attached to a frustum of a cone. If diameter of the top and bottom of the frustum is 18 cm and 8 cm and the slant height of the frustum of cone is 13 cm. Find the surface area of the tin required to make the funnel (Express your answer in terms of π)



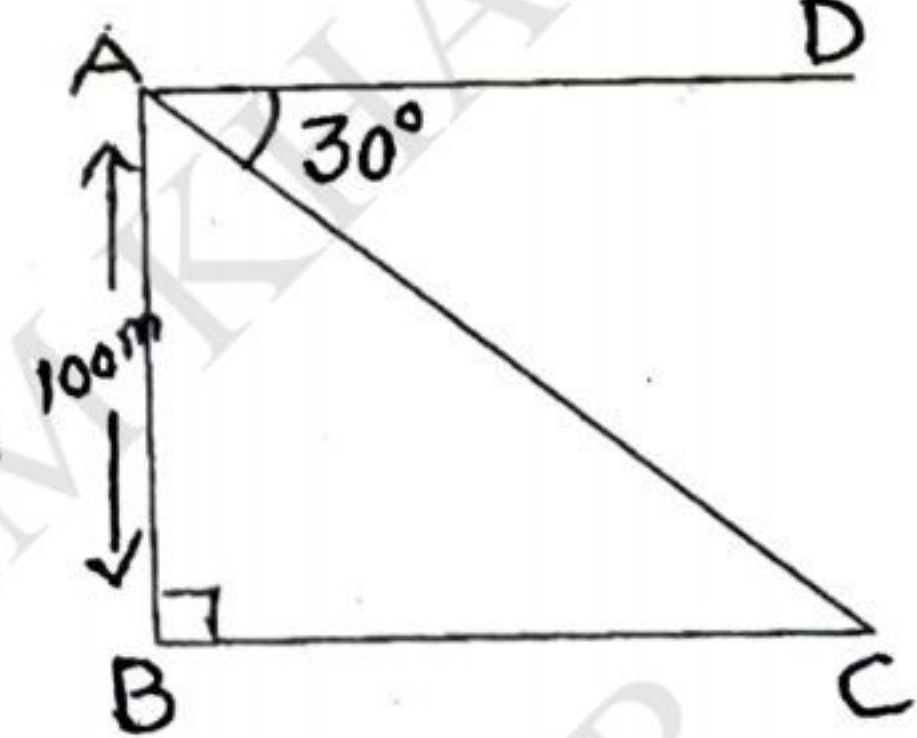
(3)

Q.5. Solve the following sub questions (any one)

1) In the figure AB represents the lighthouse and 'C' is the position of the ship. An observer from top of lighthouse looks at a ship and finds the angle of depression to be 30° . If the height of lighthouse is 100 metres then

a) What is the measure of $\angle ACB$? why?

b) apply $\tan \angle ACB$ to find the distance between the ship and the light house.



2) Draw a circle with radius 3.4 cm. Draw a Chord MN of length 5.7 cm in it. Construct tangents at point M and N to the circle without using the centre.
