PVG's

Muktangan English School & Jr. College, Pune - 9

Unit Test I (2024-25)
Standard - X

Subject - Mathematics (Part-II) | **Marks - 20**
Date - 12.8.2024 | **Time - 9.30 a.m. to 10.45 a.m.**

Q.I (A) For each question, four alternatives are given. Choose the correct alternatives and write the correct alphabet to indicate the answer. **(2)**

1) The length of the side of a cube of volume $1m^3$ is ..... .

(A) 1 cm (B) 10 cm (C) 100 cm (D) 1000m

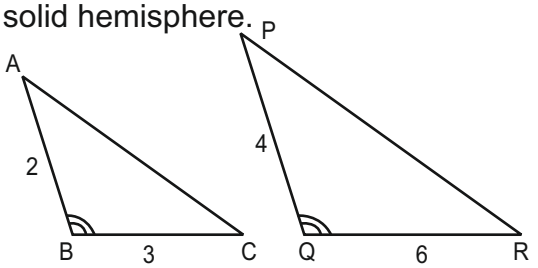
2) Out of the following, which is the Pythagorean triplet ?

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

(B) Attempt the following subquestions. **(2)**

1) State the formula for total surface area of solid hemisphere.

2) Observe the adjoining figure, hence state by which test the given pair of triangles are similar ?



Q. II (A) Attempt any one of the following subquestions : **(2)**

1) If radius of a circle is 7 cm, then find the length of the arc when the corresponding central angle is 180^o by completing the activity given below.

⟶ **Solution :**

$r = 7$ cm; $\theta = 180^o$ ..... (given)

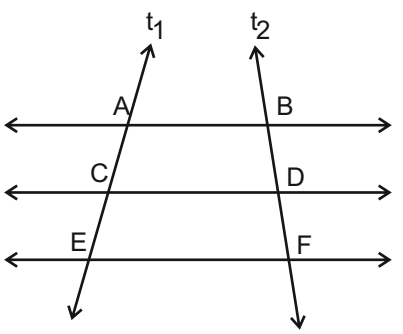
$\therefore$ Length of arc $= \frac{\theta}{360^o} \times \square$ ..... (formula)

$= \frac{\theta}{360^o} \times 2 \times \frac{22}{7} \times \square$

After solving,

Length of Arc = $\square$ cm

2) In the adjoining figure, AB II CD II EF and t_1 and t_2 are the transversals. If AC = 5.4, CE = 9, BD = 7.5, then find DF by completing the activity below :



⟶ **Solution :**

AB II CD II EF ..... (given)

$\therefore \frac{AC}{\square} = \frac{\square}{DF}$ .....(Reason .....)

$\therefore \frac{5.4}{9} = \frac{\square}{DF}$

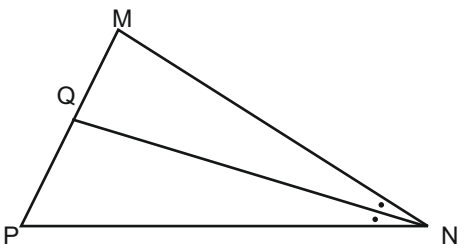
$\therefore DF = \square$ ..... (on solving)

(B) Attempt any two of the following subquestions. **(4)**

1) If AB = 24 cm, DE = 16 cm and $\Delta ABC \sim \Delta DEF$ then find $A(\Delta ABC) : A(\Delta DEF)$.

2) Area of a sector of a circle of radius 15 cm is 30 cm^2. Find the length of the arc of the sector.

3) In the adjoining figure,
NQ is the bisector of $\angle MNP$ of ΔMNP.
If MN = 5, PN = 7, MQ = 2.5,
then, find QP.



Q.III Attempt any one of the following sub-questions : **(3)**

1) In the adjoining figure, $\angle QPR = 90^o$, seg PM $\perp$ seg QR and Q - M - R, PM = 10, QM = 8, then find MR by completing the activity given below :

⟶ **Solution :**

In ΔPQR,

$\angle QPR = 90^o$ ..... (given)

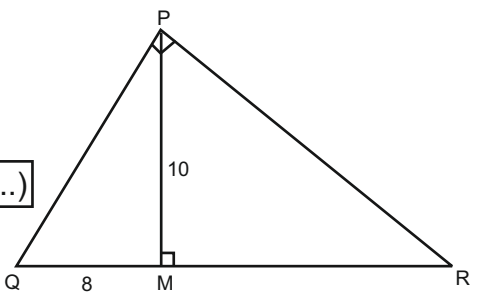
seg PM $\perp$ Hypotenuse QR ..... (given)

$\therefore \square$ = QM X MR .....(Reason .....)

$\therefore \square$ = 8 X MR

$\therefore \square$ = 8 X MR

$\therefore$ MR = $\square$ ..... (on solving)



2) The circular faces of a frustum of cone with radii 21 cm and 14 cm have height 24 cm. Find the curved surface area of frustum by completing the activity given below :

⟶ Solution :

Here r_1 = 21 cm, r_2 = 14 cm,

$\therefore$ Slant height of frustum = l

$$= \sqrt{h^2 + (r_1 - r_2)^2}$$

$= \sqrt{(24)^2 + (21 - 14)^2}$

$= \sqrt{576 + \square^2}$

$= \sqrt{576 + \square}$

$= \sqrt{625}$

$\therefore l = \square$ cm

$\therefore$ Curved surface area of frustum

$= \square$ ..... (formula)

$= \pi$ X (21 + 14) X 25

$= \pi$ X $\square$ X 25

$= \frac{22}{7}$ X $\square$ X 25

$= \square$ sq.cm. ..... (on solving)

(B) Attempt any one of the following subquestions. **(3)**

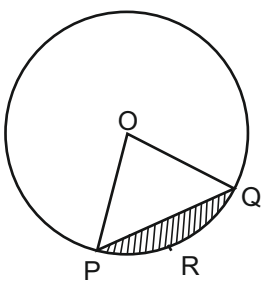
1) Prove : If a line parallel to a side of a triangle intersects the remaining sides in two distinct points, then the line divides the sides in the same proportion.

2) Prove : In a right angled triangle, the square of the hypotenuse is equal to the sum of the squares of remaining two sides.

Q.IV Attempt any one of the following subquestions : **(4)**

1) In ΔABC, point M is mid point of side BC. If $AB^2 + AC^2 = 290$ cm^2 and AM = 9 cm, then find l(BC).

2) In the adjoining figure,
O is the centre of the circle.
PQ is a chord, $\angle POQ = 90^o$
area of shaded region is 114 cm^2
Find the radius of the circle.
($\pi = 3.14$)



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