Aakash + BYJU'S

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Term Test 2022-23

Std: X MHB **Subject: Geometry** **Marks: 40**

Duration: 2hrs

Topics Covered: Similarity, Pythagoras Theorem, Circles, Geometric Constructions, Coordinate Geometry, Trigonometry, Mensuration

Note: (1) All questions are compulsory.
(2) Use of a calculator is not allowed.

Q. 1. (A) Solve the following questions: (Any four) **(4 × 1 = 4)**

1. If □ABCD is a parallelogram of AB = 4 cm and BC = 5 cm, then find AD and DC. State your reason.

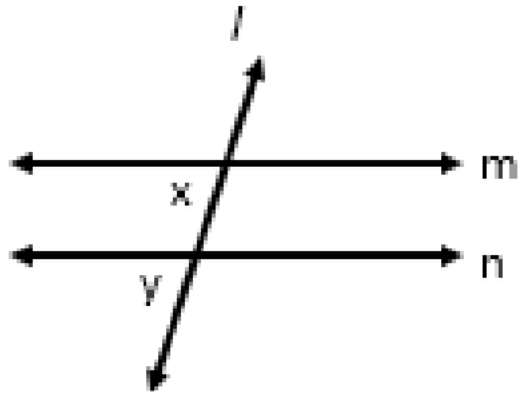
2. If the length of the longest chord of a circle is 17 cm, then find the radius of the circle.

3. Write the equation of a line parallel to the X-axis at a distance of 4 units from it and above the X-axis.

4. What is the value of sin 45° and tan 60°?

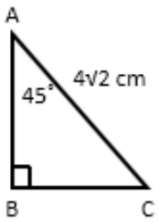
5. Find the volume of a cube of length 10 cm.

6. In the figure, ∠x = 70° and ∠y = 71°. State with reason whether line m is not parallel to line n. Justify.



(B) Solve the following questions: (Any two) **(2 × 2 = 4)**

1. In ΔABC, ∠ABC = 90°, ∠BAC = 45° and AC = $4\sqrt{2}$ cm. Find AB.



2. If tan θ = 1, then find the value of θ and sin θ.

3. □ABCD is a parallelogram. If ∠A = 3x and ∠C = 120°, then find the value of x.

Q. 2. (A) Choose the correct alternatives: **(4 × 1 = 4)**

1. The diagonal of a square of side 10 cm is

A. $10\sqrt{3}$ cm

B. $10\sqrt{2}$ cm

C. 10 cm

D. $5\sqrt{2}$ cm

2. Sides of two similar triangles are in the ratio 3:5. Areas of these triangles are in the ratio

A. 25:9

B. 3:5

C. 9:25

D. 5:3

3. If the area of the sector and the length of its corresponding arc are numerically equal, then the radius of the sector is

   A. 2π

   B. 2

   C. 4

   D. 4π

4. $\dfrac{1+\tan^2 A}{1+\cot^2 A} =$

   A. $\sec^2 A$

   B. -1

   C. $\cot^2 A$

   D. $\tan^2 A$

(B) Solve the following questions: (Any two) **(2 × 2 = 4)**

1. Determine whether (11, 12, 15) is a Pythagorean triplet? Justify.

2. If $x = a \sin\theta$ and $y = b \cos\theta$, then prove that $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$.

3. Find the slope of the line passing through the points $(-6, -2)$ and $(5, 4)$.

Q. 3. (A) Complete the following activities: (Any two) **(2 × 2 = 4)**

1. In ΔRST, if ∠S = 90°, ∠T = 30° and RT = 12 cm, then find RS and ST.

2. Two circles having radii 3.5 cm and 4.8 cm touch each other internally. Find the distance between their centres.

3. Draw any circle. Take any point C on it and construct a tangent at C without using the centre of the circle.

(B) Solve the following questions: (Any two) **(2 × 2 = 4)**

1. Two circles of radii 5.5 cm and 4.2 cm touch each other externally. Find the distance between their centres.

2. The base of a triangle is 9 and the height is 5. The base of another triangle is 10 and the height is 6. Find the ratio of areas of these triangles.

3. Find the volume of a sphere of diameter 6 cm (π = 3.14).

Q. 4. Solve the following questions: (Any three) **(3 × 3 = 9)**

1. Find the coordinates of centroid of a triangle whose vertices are (0, 6), (8, 12) and (8, 0).

2. The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm. If the height of the frustum is 8 cm, then find
   i. Slant height of the frustum
   ii. Curved surface area of the frustum
   iii. Total surface area of the frustum

3. If cos θ = ½, then find the value of $\frac{2\sec\theta}{1+\tan^2\theta}$.

4. Three circles touch each other pairwise externally. If the distance between their centres is 6 cm, 8 cm and 10 cm, then find their radii.

Q. 5. Solve the following questions: (Any one) **(4 × 1 = 4)**

1. The area of a sector of a circle of 6 cm radius is 15π sq. cm. Find the measure of the arc and length of the arc corresponding to the sector.

2. ΔABC ~ ΔPQR. In ΔABC, AB = 5.4 cm, BC = 4.2 cm, AC = 6 cm. AB:PQ = 3:2. Construct ΔABC and ΔPQR.

Q. 6. Solve the following questions: (Any one) **(3 × 1 = 3)**

1. Using the slope concept, show that the points P(3, 0), Q(6, −2) and R(−3, 4) are collinear.

2. The sides of the smaller triangle out of two similar triangles are 4 cm, 5 cm and 6 cm. If the perimeter of the larger triangle is 90 cm, then what are the lengths of the sides of the larger triangle?