ANANDALAYA
PERIODIC TEST – 3
Class: X

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Subject : Mathematics	M.M: 40
Date : 06-01-2023	Time: 1hour 30 Minutes

General Instructions:

1. The question paper consists of 17 questions divided into 4 sections A, B, C and D

2. All questions are compulsory.

3. Section A comprises of 5 questions of 1 mark each. Internal choice has been provided in one question.

4. Section B comprises of 5questions of 2 marks each. Internal choice has been provided in one question.

5. Section C comprises of 5 questions of 3 marks each. An internal choice has been provided in one question.

6. Section D comprises of 2 questions of 5 marks each. An internal choice has been provided in one question.

SECTION – A

1. The area of a circle whose area and circumference are numerically equal is _____. (1)

    (A) 2π sq. units   (B) 4π sq. units   (C) 6π sq. units   (D) 8π sq. units

2. To form a circle of radius r, four minor sectors of equal measure are joined. Which of these options completes the sentence below? The sum of the areas of the four minor sectors is equal to the _____. (1)

    (A) area of the semicircle of diameter 2r.
    (B) area of the circle of diameter 2r.
    (C) circumference of the circle of radius r.
    (D) circumference of the circle of diameter r.

3. If the volume of a 7 cm high right circular cylinder is 448π cm^3, then what is its radius? (1)

    (A) 2 cm   (B) 4 cm   (C) 8 cm   (D) 6 cm

4. If the perimeter of a semi-circular protractor is 36 cm; What is its diameter? (Use $\pi = 22/7$) (1)
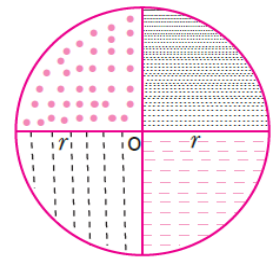
    OR

    Jeevan draws a circle with diameter 6 units. He draws another circle by increasing the radius of the previously drawn circle by 4 units. What would be the quotient if he divides the circumference of the newly formed circle by its diameter?

5. If the length of the ladder placed against a wall is twice the distance between the foot of the ladder and the wall. Find the angle made by the ladder with the horizontal. (1)

SECTION – B

6. From a point on the ground, the angles of elevation of the bottom and the top of a tower are fixed at the top of a 20m high building 45° and 60° respectively. Find the height of the tower. (2)

7. A paper is in the form of a rectangle *ABCD* in which *AB* = 18 cm and *BC* = 14 cm. A semicircular portion with *BC* as diameter is cut off. Find the area of the remaining paper. (2)
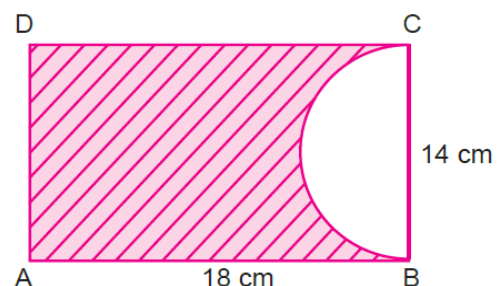
8. If two tangents inclined at 60° are drawn to a circle of radius 3 cm, then find length of each (2) tangent.

OR

In the adjoining figure, if ΔABC is circumscribing a circle, then find the length of BC.
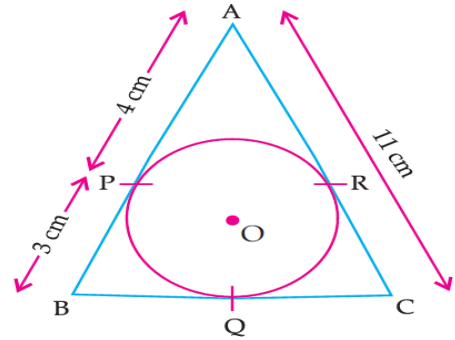
9. The tops of two towers of height x and y, standing on the ground, subtend the angles of 30° and (2) 60° respectively at the centre of the line joining their feet, then find x : y.

10. Two cubes each of volume of 64 cm³ are joined end to end. Find the surface area of the resulting (2) cuboid.

SECTION – C

11. In the given figure, PQ and PR are tangents to the circle (3) with centre O such that ∠QPR = 50°, then find ∠OQR.
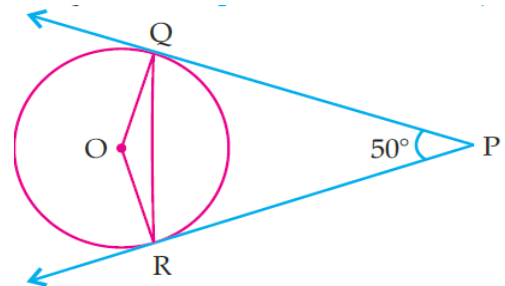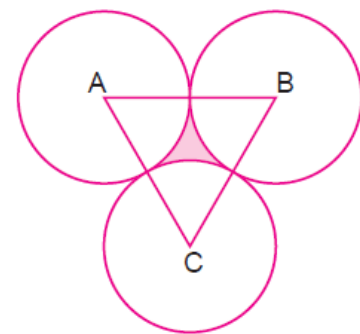

12. A cone and a cylinder have the same radii but the height of the cone is 3 times that of the (3) cylinder. Find the ratio of their volumes.

OR

Find the curved surface area (in terms of π) of a right-circular cone of height 15 cm and base diameter 16 cm.

13. ABC is an equilateral triangle. What is the area of the (3) shaded region if the radius of each of the circle is 1 cm?


14. Find the area of a square inscribed in a circle of diameter p cm. (3)

15. In given figure, AB is the diameter of a circle with (3) centre O and AT is a tangent. If ∠AOQ = 58°, find measures of ∠ATQ.
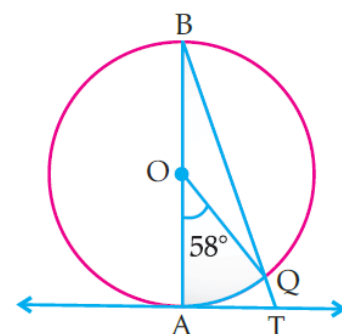
16. Two solid cones A and B are placed in a cylindrical tube as shown in the figure. The ratio of their capacities is 2 : 1. Find the heights and capacities of cones. Also, find the volume of the remaining portion of the cylinder. (5)

21 cm

6 cm

A   B
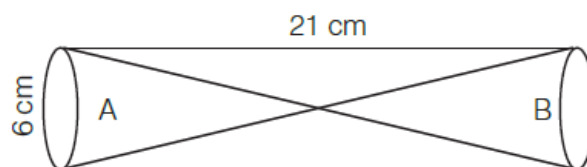
Case based study question

17. A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Kartavya Path (formerly called 'Rajpath' the Kings way), is about 138 feet (42 metres) in height.

(i) What is the angle of elevation if they are standing at a distance of 42 m away from the monument? (2)

(ii) They want to see the tower at an angle of 60°. So, they want to know the distance where they should stand and hence find the distance. (keep answer with $\sqrt{3}$). (2)

(iii) The ratio of the length of a rod and its shadow is 1:1.The angle of elevation of the Sun is___. (1)

(A) 30°   (B) 45°   (C) 60°   (D) 90°

OR

(iii) The angle formed by the line of sight with the horizontal when the object viewed is below the horizontal level is

(A) corresponding angle   (B) angle of elevation

(C) angle of depression   (D) complete angle