CBSE Board

Class X Mathematics (Standard)

Sample Paper - 2

Term 2 – 2021 - 22

Time: 2 hours   **Total Marks: 40**

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
5. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

Section A

Q1 – Q6 are of 2 mark each.

1. If 17th term of an AP exceeds its 10th term by 7. Find the common difference.

<p style="text-align:center">OR</p>

Which term of the AP 3, 15, 27, 39, … will be 132 more than its 54th term?

2. Sum of the areas of two squares is 468 m². If the difference of their perimeters is 24 m, find the sides of the two squares.

3. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.
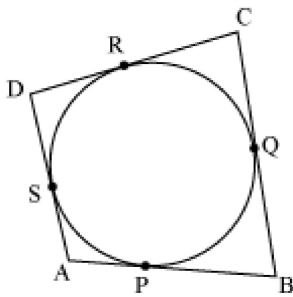
4. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.

5. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs.18. Find the missing frequency f.

Daily pocket allowance (in Rs)	11 – 13	13 – 15	15 –17	17 – 19	19 – 21	21 – 23	23 – 25
Number of workers	7	6	9	13	f	5	4

6. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side, find the sides of the field.

Section B

Q7 – Q10 are of 3 mark each.

7. The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode.

Number of students per teacher	Number of states/U.T
15 – 20	3
20 – 25	8
25 – 30	9
30 – 35	10
35 – 40	3
40 – 45	0
45 – 50	0
50 – 55	2

8. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

9. If the median of the distribution is given below is 28.5, find the values of *x* and *y*.

Class interval	Frequency
0 – 10	5
10 – 20	*x*
20 – 30	20
30 – 40	15
40 – 50	*y*
50 – 60	5
Total	60

10. From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° repectively. Find the height of the tower.

OR

A statue, 1.6 m tall, stands on a top of pedestal, from a point on the ground, the angle of elevation of the top of statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal.

Section C

Q11 – Q14 are of 4 mark each.

11. A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream. The ice cream is to be filled into cones of height 12 cm and diameter 6 cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice cream.

12. In the given figure XY and X′Y′ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY and A and X′Y′ at B. Prove that $\angle AOB = 90°$.
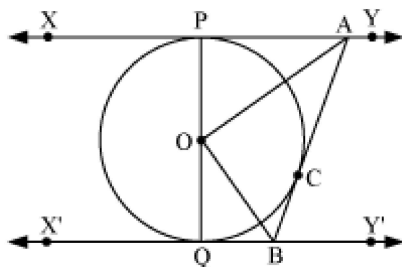
OR

Prove that the parallelogram circumscribing a circle is a rhombus.

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13. A bird flying at height can see the top of the two buildings of height 534 m and 300 m. The angles of depression from bird, to the top of first and second buildings are 30° and 60° respectively. If the distance between the two buildings is 142 m, and the bird is vertically above the midpoint of the distance between the two buildings, answer the following questions.

Building I   Building II

i)   Draw a labelled figure on the basis of the given information and find the approximate height of the bird from ground.
ii) Find the distance between bird and top of building I.

14. Rakesh is much worried about his upcoming assessment on A. P. He was vigorously practicing for the exam but unable to solve some questions. One of these questions is as shown.

If the 3rd and the 9th terms of an A.P. are 4 and −8 respectively, then help Rakesh in solving the problem.
i)   Form an A.P using the given data
ii) Find which term of the A.P. is −160?