



Modern Middle East International School

Academic Year 2021 – 2022

PREBOARD EXAMINATION -2

Name:	Subject: Mathematics	Date: 20-2-2022
Class: 10	Set: A	Duration: 2 hours
Section:	Max. Marks: 40	Marks Obtained:

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

[6 x 2 = 12M]

- 1) Find the sum of first 15 multiples of 8.

(OR)

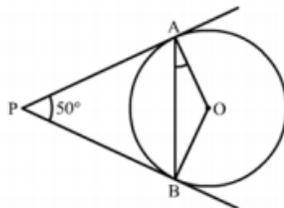
Find the 9th term from the end (towards the first term) of the AP: 5, 9, 13, ..., 185

- 2) Find the discriminant of the equation $2x^2 - \sqrt{5}x - 2 = 0$ and hence find the nature of its roots.

Find them, if they are real.

- 3) In the given figure, PA and PB are tangents to the circle with centre O such that $\angle APB = 50^\circ$.

Write the measure of $\angle OAB$.



- 4) A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire.

- 5) The arithmetic mean of the following frequency distribution is 53. Find the value of k.

Class	0-20	20-40	40-60	60-80	80-100
Frequency	12	15	32	k	13

- 6) Had Ajita scored 10 more marks in her mathematics test out of 30 marks, 9 times these marks would have been the square of her actual marks. How many marks did she get in the test?

(OR)

Find the roots of the following equation:

$$x - \frac{1}{x} = 3, x \neq 0$$

SECTION-B

[3 x 4 = 12M]

- 7) Mode of the following frequency distribution is 65 and sum of all the frequencies is 70. Find the missing frequencies x and y.

Class	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160
Frequency	8	11	x	12	y	9	9	5

- 8) Draw two concentric circles of radii 3 cm and 5 cm. Taking a point on outer circle construct the pair of tangents to the other. Measure the length of a tangent and verify it by actual calculation.
- 9) For helping poor girls of their class, students saved pocket money as shown in the following table:

Money saved(in ₹)	5-7	7-9	9-11	11-13	13-15
No. of students	6	3	9	5	7

Find median for this data.

- 10) The angle of elevation of an aeroplane from a point on the ground is 60° . After a flight of 30 seconds the angle of elevation becomes 30° . If the aeroplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the aeroplane.

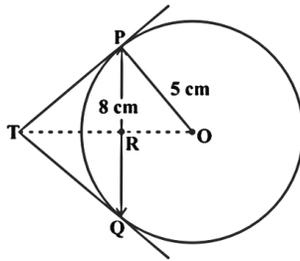
(OR)

Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60° . Find the distance between the two men.

SECTION-C

[4 x 4 = 16M]

- 11) From a solid cylinder of height 2.4cm and base diameter 1.4 cm, a conical cavity of same height and same base diameter is hollowed out. Find the total surface area of the remaining solid.
- 12) PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.



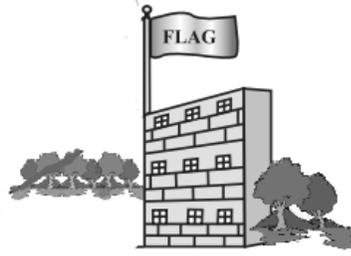
(OR)

Prove that the parallelogram circumscribing a circle is a rhombus.

- 13) Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs.1,18,000 by paying every month starting with the first installment of Rs.1000. If he increases the installment by Rs.100 every month, answer the following questions.



- i) Form an A.P representing the given situation. What amount will be paid by him in the **30th** installment .
- ii). Find the total amount paid by him in 30 installments. What amount of loan does he still have to pay after the 30th installment ?
- 14) A flagstaff is a pole on which a flag is or can be displayed. In India, one will find a flagstaff in front of the District Collectorate Office buildings, important state and central government buildings where flag hoisting ceremony will be held on the Independence Day (15 August) and Republic days (26 January).



From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30° . A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° . (You may take $\sqrt{3} = 1.732$)

- i) Draw a neat figure to illustrate the problem. Find the distance of the building from the point P.
- ii) Find the length of the flagstaff