

PRE-BOARD EXAMINATION TERM II (2021-22)

CLASS-X
MATHEMATICS

TIME ALLOWED: 120 MINUTES

MAXIMUM 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, out of which two are case study based questions.

SECTION A

1. Find the root of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$ 2

OR

If the quadratic equation $Px^2 - 2\sqrt{5}Px + 15 = 0$ has two equal roots then find the value of P

2. Find the height of the largest right circular cone that can be cut out of a cube whose volume is 729cm^3 2
3. Distribution of marks obtained by 50 students in a test is given below. Find the mean marks. 2

MARKS	Less than 20	Less than 40	Less than 60	Less than 80	Less than 100
NO. OF STUDENTS	4	10	28	36	50

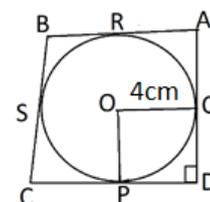
4. Find the value of x if the mode is given to be 58 years. 2

Age (in Years)	20-30	30-40	40-50	50-60	60-70	70-80
No. of Patients	5	13	x	20	18	19

5. Prove that parallelogram circumscribing a circle is a rhombus. 2

OR

In the following figure find PC if $AB=13\text{cm}$, $BC=7\text{cm}$ and $AD=15\text{cm}$.



6. The sum of n terms of an AP is $n^2 - 3n$. find the 18th term. 2

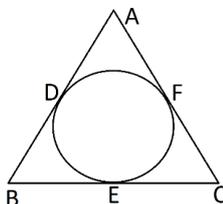
SECTION – B

7. The sum of 1st 7 terms of an AP is 63 and next 7 terms is 161. Find the 28th term of the AP. 3
8. A man in a boat is rowing away from a light house 100m high takes 2 minutes to change angle of elevation of the top of the light house from 60° to 30° . Find the speed of the boat in m/minutes. ($\sqrt{3}=1.732$) 3

OR

The angle of depression of the top and bottom of a building 50m high as observed from the top of a tower are respectively 30° and 60° . Find the height of the tower.

9. A circle is inscribed in a triangle whose sides AB, BC and AC are respectively 8cm, 10cm and 12cm. find the length of AD, BE and CF. 3



10. Three consecutive integers are such that the sum of the squares of the first and product of the other two is 46. Find the integers. 3

SECTION – C

11. Draw a pair of tangents to a circle of radius 3.5cm which are inclined at an angle 60° . 4

OR

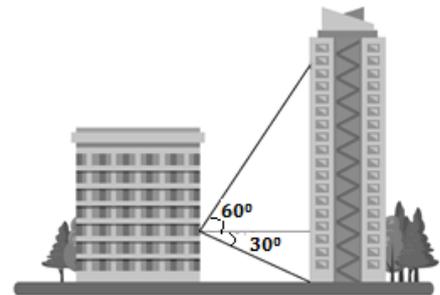
Construct two consecutive circles of radii 3cm and 5cm. draw two tangents from a point on the bigger circle to the smaller circle.

12. The median of the following data is 35
Find the values of a and b 4

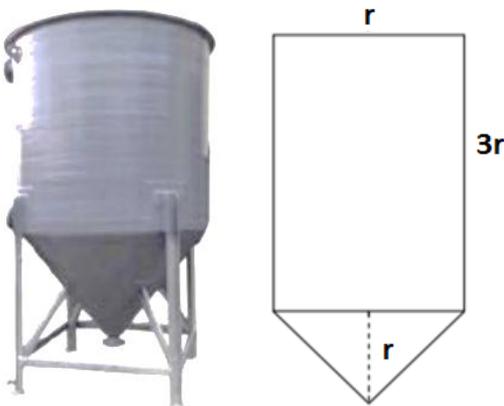
Class Intervals	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequency	10	20	a	40	b	25	15	170

13. From his hotel room window on the fourth floor, Ranjan notices some window washers high above him on the hotel across the street. Curious as to their height above ground, he quickly estimates the buildings are 60 m apart, the angle of elevation to the workers is about 60° , and the angle of depression to the base of the hotel is about 30° . 4

- (i) How high above ground is the window of Ranjan’s hotel room?
(ii) How high above ground are the workers?



14. The advantages of cone bottom tanks are found in nearly every industry, especially where getting every last drop from the tank is important. This type of tank has excellent geometry for draining, especially with high solids content slurries as these cone tanks provide a better full-drain solution. The conical tank eliminates many of the problems that flat base tanks have as the base of the tank is sloped towards the centre giving the greatest possible full-drain system in vertical tank design. 4



Rajesh has been given the task of designing a conical bottom tank for his client. Height of conical part is equal to its radius. Length of cylindrical part is the 3 times of its radius. Tank is closed from top. The cross section of conical tank is given below.

- (i) If radius of cylindrical part is taken as 3 meter, what is the volume of above conical tank?
(ii) What is the area of metal sheet used to make this conical tank? Assume that tank is covered from top.
($\pi=3.14$ and $\sqrt{2}=1.414$)