

Sample Paper 1

Class – X Exam 2021-22 (TERM – II)

Mathematics Standard (041)

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. An internal choice has been provided in one question. It contains two case study based questions.

SECTION A

1. Solve for x (in terms of a and b) :

$$\frac{a}{x-b} + \frac{b}{x-a} = 2, x \neq a, b$$

OR

Value of the roots of the quadratic equation, $x^2 - x - 6 = 0$ are

2. If the 1st term of a series is 7 and 13th term is 35. Find the sum of 13 terms of the sequence.
3. A circle is inscribed in a ΔABC touching AB , BC and AC at P , Q and R respectively. If $AB = 10$ cm $AR = 7$ cm and $CR = 5$ cm, then find the length of BC
4. A solid metallic of dimensions $9\text{m} \times 8\text{m} \times 2\text{m}$ is melted and recast into solid cubes of edge 2 m. Find the number of cubes so formed.
5. Write the relationship connecting three measures of central tendencies. Hence find the median of the give data if mode is 24.5 and mean is 29.75.
6. The following distribution shows the marks scored by 140 students in an examination. Calculate the mode of the distribution :

Marks	0-10	10-20	20-30	30-40	40-50
Number of students	20	24	40	36	20

OR

Calculate the median from the following data :

Marks	0-10	10-20	20-30	30-40	40-50
Number of Students	5	15	30	8	2

Section B

7. Solve the following equation: $\frac{1}{x} - \frac{1}{x-2} = 3$, $x \neq 0, 2$
8. The 17th term of an AP is 5 more than twice its 8th term. If 11th term of AP is 43, then find its n^{th} term.
9. A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 18 minutes for the angle of depression to change from 30° to 60° , how soon after this will the car reach the tower?
10. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length. Also to verify the measurement by actual calculation.

OR

Draw a circle of radius 2 cm with centre O and take a point P outside the circle such that $OP = 6.5$ cm. From P , draw two tangents to the circle.

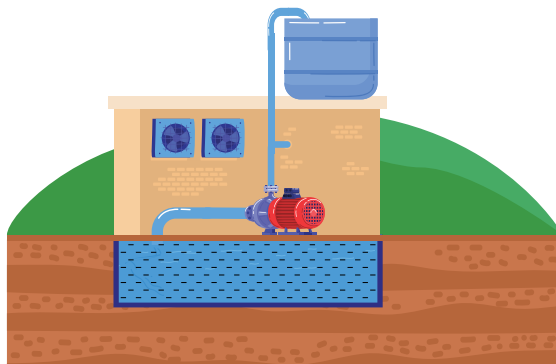
Section C

11. The angle of depression of two ships from an aeroplane flying at the height of 7500 m are 30° and 45° . If both the ships are in the same line that one ship is exactly behind the other, find the distance between the ships.
12. Prove that tangent drawn at any point of a circle perpendicular to the radius through the point contact.

OR

Prove that tangent drawn at any point of a circle perpendicular to the radius through the point contact.

13. Underground water tank is popular in India. It is usually used for large water tank storage and can be built cheaply using cement-like materials. Underground water tanks are typically chosen by people who want to save space. The water in the underground tank is not affected by extreme weather conditions. The underground tanks maintain cool temperatures in both winter and summer. Electric pump is used to move water from the underground tank to overhead tank.



Ramesh has build recently his house and installed a underground tank and overhead tank. Dimensions of tanks are as follows :

Underground Tank : Base $2\text{ m} \times 2\text{ m}$ and Height 1.1 m.

Overhead tank : Radius 50 cm and Height 175 cm

- (i) What is the capacity of the underground tank ?
 (ii) What is the ratio of the capacity of the underground tank to the capacity of the overhead tank?

14. An inspector in an enforcement squad of electricity department visit to a locality of 100 families and record their monthly consumption of electricity, on the basis of family members, electronic items in the house and wastage of electricity, which is summarise in the following table.

Monthly Consumption (in kwh)	Number of families
0-100	2
100-200	5
200-300	x
300-400	12
400-500	17
500-600	20
600-700	y
700-800	9
800-900	7
900-1000	4

Inspector calculated that median of the above data is 525 and after that he lost two data which is given as x and y in table.

Based on the above information, answer the following questions.

- (i) What is the value of lost data x ?
 (ii) What is the value of lost data y ?



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