SAMPLE QUESTION PAPER

SESSION 2025-2026

Class 10th | **MATHEMATICS** | **SET-01**

Time: 180 Minutes **M.M.: 80**

General Instructions:

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 2 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

SECTION-A

1. The HCF of two numbers is 23 and their LCM is 1449. If one of the numbers is 161, the other number is:

(A) 207 (B) 237
(C) 197 (D) 217

2. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - x - 4$, then the value of $\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$ is:

(A) $\frac{3}{4}$ (B) $\frac{15}{4}$
(C) $-\frac{15}{4}$ (D) $\frac{1}{4}$

3. The value of k for which the system of equations $x + 2y = 3$ and $5x + ky + 7 = 0$ has no solution is:

(A) $k = 10$ (B) $k \neq 10$
(C) $k = \frac{5}{3}$ (D) $k \neq \frac{5}{3}$

4. If the roots of the equation $2x^2 - 10x + k = 0$ are reciprocal of each other, the value of k is:

(A) 2 (B) 10
(C) 5 (D) –5

5. The sum of the first n terms of an AP is given by $S_n = 2n^2 + 3n$. The common difference of the AP is:

(A) 5 (B) 4
(C) 6 (D) 3

6. The ratio in which the y-axis divides the line segment joining the points (5, –6) and (–1, –4) is:

(A) 1 : 5 (B) 5 : 1
(C) 2 : 3 (D) 3 : 2

7. In a $\Delta ABC, DE \parallel BC$. If $AD = x, DB = x - 2$, $AE = x + 2$, and $EC = x - 1$, then the value of x is:

(A) 3 (B) 4
(C) 5 (D) 6

8. The angle of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. The height of the tower is:

(A) 2 m
(B) 4 m
(C) 6 m
(D) 9 m

9. A solid metal cone is melted and recast into a solid sphere. If the radius of the cone's base is R and its height is H, and radius of the sphere is r, then R^2 H is equal to:

(A) $3r^3$ (B) $4r^3$
(C) $2r^3$ (D) r^3

10. If the mean of the first n natural number is 21, the value of n is:

(A) 40 (B) 41
(C) 42 (D) 43

11. A letter is chosen at random from the word "MATHEMATICS". The probability that the letter is a vowel is:

(A) $\frac{4}{11}$ (B) $\frac{3}{11}$
(C) $\frac{5}{11}$ (D) $\frac{2}{11}$

12. If the product of two zeroes of the polynomial $f(x) = x^2 - 5x^2 - 14x + 80$ is 8, the third zero is:

(A) –10
(B) 10
(C) 5
(D) –5

13. If the roots of the equation $x^2 + px + q = 0$ are α and β, the equation whose roots are α^2 and β^2 is:

(A) $x^2 - \left(p^2 - 2q\right)x + q^2 = 0$

(B) $x^2 + \left(p^2 - 2q\right)x + q^2 = 0$

(C) $x^2 - \left(p^2 + 2q\right)x + q^2 = 0$

(D) $x^2 + \left(p^2 + 2q\right)x + q^2 = 0$

14. The midpoint of the line segment joining the points A(2, p) and B(–2, 4) is the origin (0, 0). The value of p is

(A) – 4 (B) 4
(C) 2 (D) –2

15. The areas of two similar triangles are 121 sq cm and 64 sq cm. If the median of the first triangle is 12.1 cm, the corresponding median of the other triangle is:

(A) 8.8 cm
(B) 8 cm
(C) 9.1 cm
(D) 10 cm

16. A man standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank is 60°. When he moves 40 m away from the bank, the angle of elevation becomes 30°. The height of the tree is:

(A) $10\sqrt{3}$ m
(B) $20\sqrt{3}$ m
(C) $30\sqrt{3}$ m
(D) $40\sqrt{3}$ m

17. The sum of the first 4 terms of an AP is 28 and the sum of first 8 terms is 88. The first term of the AP is:

(A) 2 (B) 3
(C) 4 (D) 5

18. A box contain 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box the probability that is bears a perfect square number is:

(A) $\frac{1}{10}$

(B) $\frac{1}{9}$

(C) $\frac{1}{5}$

(D) $\frac{1}{2}$

19. **Assertion:** The polynomial $f(x) = 2x^2 + 5x - 3$ has zeroes which are rational.

Reason: The roots of the quadratic equation $ax^2 + bx + c = 0$ are rational if the discriminant $b^2 - 4ac$ is a perfect square.

(A) Both Assertion and Reason arc true, and the Reason is the correct explanation of the Assertion.

(B) Both Assertion and Reason arc true, but the Reason is not the correct explanation of the Assertion.

(C) Assertion is true, but Reason is false.

(D) Assertion is false, but Reason is true.

20. **Assertion :** The quadratic equation $x^2 - 4x + k = 0$ has two distinct real roots if $k < 4$

Reason : The quadratic equation $ax^2 + bx + c = 0$ has two distinct real roots if and only if the discriminant $b^2 - 4ac > 0$

(A) Both Assertion and Reason arc true, and the Reason is the correct explanation of the Assertion.

(B) Both Assertion and Reason arc true, but the Reason is not the correct explanation of the Assertion.

(C) Assertion is true, but Reason is false.

(D) Assertion is false, but Reason is true.

SECTION-B

21. Find the least number which when divided by 12, 16 and 24 leaves remainder 7 in each case.

22. In ΔABC, P and Q are points on sides AB and AC respectively such that $PQ \| BC$. If AP = 4 cm, PB = 6 cm and PQ=3cm, determine BC.

23. If a circle touches the side BC of a triangle ABC at P and extended sides AB and AC at Q and R, respectively,

prove that $AQ = \frac{1}{2}(BC + CA + AB)$

24. If $A=B = 60^\circ$, verify that $\sin(A - B) = \sin A \cos B - \cos A \sin B$

OR

Prove the trigonometric identity:

$\tan^2 A \sec^2 B - \sec^2 A \tan^2 = \tan^2 A - \tan^2 B$

25. Find the difference of the areas of a sector of angle 120° and its corresponding major sector of a circle of radius 21 cm.

OR

A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding:

(i) minor segment

(ii) major sector.

SECTION-C

26. Maya has two pieces of cloth. One piece is 36 inches wide and the other piece is 24 inches wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips?

27. If α and β are zeroes of the quadratic polynomial $4x^2 + 4x + 1$, then form a quadratic polynomial whose zeroes are 2α and 2β.

28. Half of the difference between two numbers is 2. The sum of the greater number and twice the smaller number is 13. Find the numbers.

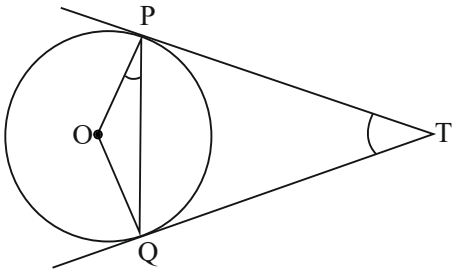
OR

Solve algebraically the following pair of linear equations for x and y

$31x + 29y = 33$

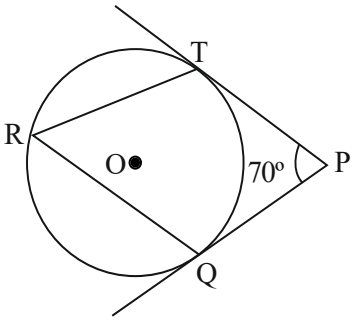
$29x + 31y = 27$

29. Two tangents TP and TQ are drawn to circle with centre O from an external point T. Prove that $\angle OPQ = \frac{1}{2}\angle PTQ$



OR

In the given figure, O is the centre of a circle. PT and PQ are tangents to the circle from an external point P. II $\angle TPQ = 70^o$, find $\angle TRQ$.



30. Prove that: $\frac{1}{\text{cosec A} - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\text{cosec A} + \cot A}$.

31. Compute the median for the following cumulative frequency distribution:

Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	Less than 90	Less than 100
0	4	16	30	46	66	82	92	100

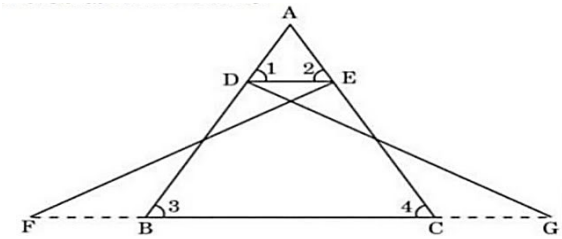
SECTION-D

32. Solve for x $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$ where a + b + x $\neq 0$ and a, b x $\neq 0$

OR

If x = – 4 is a root of the equation $x^2 + 2x + 4p = 0$, find the value of k for which the equation $x^2 + px(1 + 3k) + 7(3 + 2k) = 0$ has equal roots.

33. In the following figure, $\Delta FEC \sim \Delta GBD$ and $\angle 1 = 2$ Prove that $\Delta ADE \sim \Delta ABC$.

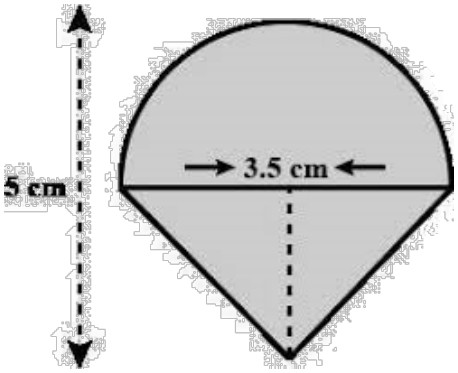


34. A rocket is in the form of a right circular cylinder closed at the lower end and surmounted by a cone with the same radius as that of cylinder. The diameter and height of cylinder are 6 cm and 12 cm. respectively. If that slant height of the conical portion is 5 cm, then find the total surface area and volume of rocker .(Use $\pi = 3.14$)

OR

Rasheed got a playing top (lattu) as his birthday present, which surprisingly had no colour on it. He wanted to colour it with his crayons. The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top 3.5 cm. Find the area he has to colour.

$\left(\text{Take } \pi = \frac{22}{7}\right)$.



35. Find the mean and the median of the following data:

Marks	Number of students
0 – 10	3
10 – 20	5
20 – 30	16
30 – 40	12
40 – 50	13
50 – 60	20
60 – 70	6
70 – 80	5

SECTION-E

36. Read the text carefully and answer the questions:

Deepa has to buy a scooty. She can buy scooty either making cashdown payment of ₹25,000 or by making 15 monthly instalments as below.

Ist month – ₹3425, IInd month – ₹3225, IIIrd month –₹3025, IVth month –₹2825 and so on

(a) Find the amount of 6^{th} instalment.

(b) Total amount paid in 15 instalments.

OR

If Deepa pays ₹2625 then find the number of instalment.

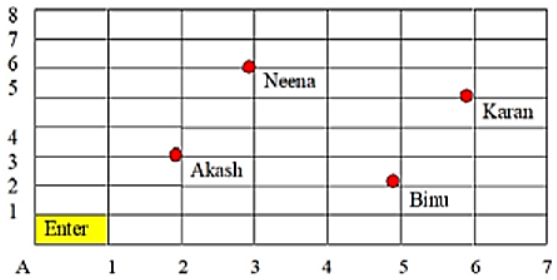
(c) Deepa paid 10^{th} and 11^{th} instalment together find the amount paid that month.

37. Read the text carefully and answer the questions:

Karan went to the Lab near to his home for COVID 19 test along with his family members.

The seats in the waiting area were as per the norms of distancing during this pandemic (as shown in the figure).

His family member took their seats surrounded by red circular area.



(a) What is the distance between Neena and Karan?

(b) What are the coordinates of seat of Akash?

OR

Find distance between Binu and Karan.

(c) What will be the coordinates of a point exactly between Akash and Binu where a person can be?

[5]

38. A flagpole is installed on the roof of a building. From a point on the ground, the angle of elevation of the top of the flagpole is 60º and the angle of elevation of the bottom of the flagpole is 45º. The height of the building is 20 meters.

Based on this information, answer the following questions:

(a) What is the distance of the observation point from the base of the building?

(b) What is the height of the flagpole?

(c) What is the length of the line segment from the observation point to the top of the flagpole?

OR

What is the length of the line segment from the observation point to the bottom of the flagpole?

■■■

[6]