Series MC-X-STD

Roll No. | | | | | | | |

Candidates must write the Q.P. Code on the title page of the answer-book.

Q.P. Code
MC/X/S/10

MATHEMATICS (STANDARD)

Class X • Sample Paper 10 • Session 2026–27

(As per the CBSE Sample Question Paper 2026–27 design)

Time allowed : 3 hours **Maximum Marks : 80**

NOTE

(i) Please check that this question paper contains 5 printed pages.
(ii) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
(iii) Please check that this question paper contains 38 questions.
(iv) Please write down the serial number of the question in the answer-book before attempting it.
(v) 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions :

Read the following instructions carefully and follow them :

(i) This question paper contains **38** questions. All questions are compulsory.
(ii) This question paper is divided into **five** Sections – **A, B, C, D** and **E**.
(iii) In **Section A**, Questions no. **1** to **18** are multiple choice questions (MCQs) and questions no. **19** and **20** are Assertion-Reason based questions of **1** mark each.
(iv) In **Section B**, Questions no. **21** to **25** are very short answer (VSA) type questions, carrying **2** marks each.
(v) In **Section C**, Questions no. **26** to **31** are short answer (SA) type questions, carrying **3** marks each.
(vi) In **Section D**, Questions no. **32** to **35** are long answer (LA) type questions, carrying **5** marks each.
(vii) In **Section E**, Questions no. **36** to **38** are case study based questions carrying **4** marks each.
(viii) There is no overall choice. However, an internal choice has been provided in **2** questions in **Section B**, **2** questions in **Section C**, **2** questions in **Section D**, and in all the sub-parts of **2** marks in **Section E**.
(ix) Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.
(x) Use of calculators is **NOT** allowed.

SECTION A

This section comprises 20 Multiple Choice Questions (MCQs) carrying 1 mark each.

1. Shalvi starts with the number 2 and her students multiply it successively by prime numbers. The last student gets 29760. The largest prime used is:

(A) 29 (B) 31 (C) 37 (D) 41

2. If α and β are the zeroes of the polynomial $x^2 + x - 1$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to:

(A) 1 (B) 2 (C) -1 (D) $-\frac{1}{2}$

3. The value of k for which the pair $2x + 3y = 7$ and $(k-1)x + (k+2)y = 3k$ has infinitely many solutions is:

(A) 7 (B) 1 (C) 3 (D) -7

4. The least positive integral value of k for which the quadratic equation $2x^2 + kx - 4 = 0$ has rational roots is:

(A) 2 (B) 1 (C) 4 (D) 3

5. If the sum of the first n terms of an A.P. is $n^2 + 2n$, then its 10^{th} term is:

(A) 21 (B) 19 (C) 23 (D) 120

6. In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. If $\dfrac{AD}{DB} = \dfrac{3}{5}$ and $DE = 6$ cm, then BC is:

(A) 16 cm (B) 10 cm (C) 12 cm (D) 18 cm

7. The perimeter of the triangle with vertices $(0, 0)$, $(4, 0)$ and $(0, 3)$ is:

(A) 12 units (B) 7 units (C) 5 units (D) 10 units

8. The value of $\sin^2 60^\circ - 2\tan 45^\circ - \cos^2 30^\circ$ is:

(A) 2 (B) -2 (C) 1 (D) -1

9. A number is selected at random from 1 to 25. The probability that it is **not** a prime number is:

(A) $\dfrac{16}{25}$ (B) $\dfrac{9}{25}$ (C) $\dfrac{3}{5}$ (D) $\dfrac{2}{5}$

10. If the area of a circle is 154 cm^2, then its circumference is:

(A) 44 cm (B) 22 cm (C) 88 cm (D) 11 cm

11. The radius of the base of a cone and the radius of a sphere are each 5 cm. If their volumes are equal, the height of the cone is:

(A) 5 cm (B) 20 cm (C) 10 cm (D) 4 cm

12. For a distribution with $n = 40$, the median class is 20–30, the cumulative frequency of the preceding class is 15 and the frequency of the median class is 10. The median is:

(A) 25 (B) 22.5 (C) 27.5 (D) 20

13. Two dice are thrown together. The probability of getting a sum of 8 is:

(A) $\dfrac{5}{36}$ (B) $\dfrac{1}{6}$ (C) $\dfrac{1}{9}$ (D) $\dfrac{7}{36}$

14. The distance between the points $(\cos\theta, \sin\theta)$ and $(\sin\theta, -\cos\theta)$ is:

(A) $\sqrt{3}$ (B) $\sqrt{2}$ (C) 2 (D) 1

15. The area of a quadrant of a circle whose circumference is 22 cm is:

(A) 9.625 cm^2 (B) 38.5 cm^2 (C) 19.25 cm^2 (D) 77 cm^2

16. The mean of 10 observations is 20. If each observation is decreased by 2 and then multiplied by 3, the new mean is:

(A) 54 (B) 58 (C) 60 (D) 18

17. From the top of a 75 m high tower, the angle of depression of a car is 30°. The distance of the car from the foot of the tower is:

(A) $75\sqrt{3}$ m (B) $25\sqrt{3}$ m (C) 75 m (D) 150 m

18. A letter is chosen at random from the letters of the word PROBABILITY. The probability that it is the letter B is:

(A) $\dfrac{2}{11}$ (B) $\dfrac{1}{11}$ (C) $\dfrac{3}{11}$ (D) $\dfrac{4}{11}$

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*Questions number **19** and **20** are Assertion and Reason based questions. Two statements are given, one is labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.*

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of the Assertion (A).

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

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

19. *Assertion (A) :* The point P on AB, where $A(-2,-2)$ and $B(2,-4)$, such that $AP = \frac{3}{7}AB$ is $\left(-\frac{2}{7}, -\frac{20}{7}\right)$.

Reason (R) : The point dividing the join of (x_1, y_1) and (x_2, y_2) in the ratio $m:n$ is $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$.

20. *Assertion (A) :* If the 2^{nd} term of an A.P. is 13 and the 5^{th} term is 25, then its 7^{th} term is 33.

Reason (R) : The n^{th} term of an A.P. is $a_n = a + (n-1)d$.

SECTION B

This section comprises 5 Very Short Answer (VSA) type questions carrying 2 marks each.

21. (a) Find the largest number that divides 2053 and 967 leaving remainders 5 and 7 respectively.

OR

(b) Find the HCF and LCM of 510 and 92 and verify that HCF $\times$ LCM = product of the numbers.

22. (a) X and Y are points on the sides PQ and PR of $\triangle PQR$. If $PX = 4$ cm, $QX = 4.5$ cm, $PY = 8$ cm and $YR = 9$ cm, show that $XY \parallel QR$.

OR

(b) $ABCD$ is a trapezium with $AB \parallel DC$; P and Q are points on AD and BC with $PQ \parallel DC$. If $PD = 18$ cm, $BQ = 3.5$ cm and $QC = 15$ cm, find AD.

23. If $\sin(A+B) = 1$ and $\cos(A-B) = \frac{\sqrt{3}}{2}$, $0^\circ < A+B \leq 90^\circ$, $A > B$, find A and B.

24. Find the area of the sector of a circle of radius 21 cm and central angle 120°. Also find the length of its arc.

25. A bag contains 4 red, 3 blue and 2 yellow balls. One ball is drawn at random. Find the probability that it is (i) red, (ii) not yellow.

SECTION C

This section comprises 6 Short Answer (SA) type questions carrying 3 marks each.

26. Prove that $\sqrt{13}$ is an irrational number.

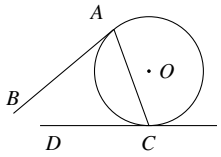
27. If α and β are the zeroes of $p(x) = x^2 - 2x - 8$, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

28. (a) The 9^{th} term of an A.P. is six times its 2^{nd} term, and its 5^{th} term is 22. Find the A.P.

OR

(b) Find the sum of the first 51 terms of an A.P. whose second and third terms are 14 and 18.

29. In the figure, AB and CD are tangents to a circle centred at O at the points A and C. Is $\angle BAC = \angle DCA$? Justify your answer.



30. Show that the points $(1, 7)$, $(4, 2)$, $(-1, -1)$ and $(-4, 4)$ are the vertices of a square.

31. (a) Prove that: $\dfrac{1+\sec A}{\sec A} = \dfrac{\sin^2 A}{1-\cos A}$

OR

(b) If $\sec\theta + \tan\theta = p$, prove that $\sin\theta = \dfrac{p^2-1}{p^2+1}$.

SECTION D

This section comprises 4 Long Answer (LA) type questions carrying 5 marks each.

32. At present, Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age will be one year less than 10 times Nisha's present age. Find their present ages.

33. State and prove the Basic Proportionality Theorem. Using it, prove that a line drawn through the mid-point of one side of a triangle, parallel to another side, bisects the third side.

34. (a) A temple has 14 pillars. Each is a cylinder of radius 0.35 m and height 3.5 m with a conical top of the same radius and height 0.84 m. Find the cost of polishing the curved surfaces of all pillars at ₹ 1.50 per m^2.

OR

(b) A spinner is made of a cone of height 3 cm and a hemisphere on opposite sides of a common circular base of diameter 3.5 cm. A cylinder circumscribes them. Find the volume of the spinner and the space inside the cylinder not occupied by the spinner.

35. (a) Hikers at point A on the south rim of a canyon see a climber at C on the north face, trying to reach the top D of the north rim. The horizontal width of the canyon is 150 m. From A, the angle of depression of the bottom F of the north face is 60°, and the angles of elevation of the climber and of the top D are 30° and 45°. Find the height of the south rim above F, how much higher the climber must climb, and the total height of the north face. (Use $\sqrt{3} = 1.7$)

OR

(b) The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of elevation of the top of the tower from the foot of the hill is 30°. If the tower is 50 m high, find the height of the hill and the distance between them.

SECTION E

This section comprises 3 case study based questions carrying 4 marks each.

36. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in the 6^{th} year and 22600 sets in the 9^{th} year. Based on the above information, answer the following questions:

(i) By how many sets does the production increase every year? *1*

(ii) Find the production in the first year. *1*

(iii) (a) Find the total production in the first 5 years. *2*

OR

(iii) (b) In which year was the production 29200 sets? *2*

37. A gardener stands at a gate T outside a circular garden with centre O. TP and TQ are tangents to the boundary and $\angle PTQ = 70°$. Based on the above information, answer the following questions:

(i) What is the measure of $\angle OPT$? *1*

(ii) Find $\angle POQ$. *1*

(iii) (a) Find $\angle OPQ$. *2*

OR

(iii) (b) If $OT = 10$ m and the radius is 6 m, find TP and the length of the chord PQ. *2*

38. The median of the following incomplete distribution is 46 and the total frequency is 230. Based on the above information, answer the following questions:

Class	10–20	20–30	30–40	40–50	50–60	60–70	70–80
Frequency	12	30	x	65	y	25	18

(i) Write the relation between x and y. *1*

(ii) Write the median class. *1*

(iii) (a) Find the values of x and y. *2*

OR

(iii) (b) Taking $x = 34$ and $y = 46$, find the mode. *2*

• • • End of Question Paper • • •

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