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/12

MATHEMATICS (STANDARD)

Class X • Sample Paper 12 • 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. The LCM of $2^3 \times 3^2$ and $2^2 \times 3^3$ is:

(A) 216 (B) 72 (C) 36 (D) 108

2. A quadratic polynomial whose zeroes are $2\sqrt{2}$ and $-3\sqrt{2}$ is:

(A) $x^2 - \sqrt{2}x - 12$ (B) $x^2 - 2\sqrt{2}x$ (C) $x^2 + \sqrt{2}x - 12$ (D) $x^2 - 2\sqrt{2}x + 6$

3. The pair of linear equations $3x - 5y = 7$ and $-6x + 10y = 7$ is:

(A) consistent (B) inconsistent

(C) dependent (D) having infinitely many solutions

4. If 4 is a root of $x^2 + px + 12 = 0$ and the equation $x^2 + px + q = 0$ has equal roots, then the value of q is:

(A) $\frac{49}{4}$ (B) 12 (C) 7 (D) 4

5. The 10^{th} term from the end of the A.P. $4, 9, 14, \ldots, 254$ is:

(A) 209 (B) 204 (C) 214 (D) 199

6. In $\triangle ABC$, $DE \parallel BC$ with D on AB and E on AC. If $AD = x$ cm, $DB = (x-2)$ cm, $AE = (x+2)$ cm and $EC = (x-1)$ cm, then x is:

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

7. The point on the y-axis which is equidistant from $(2, 3)$ and $(-4, 1)$ is:

(A) $(0, -1)$ (B) $(0, 1)$ (C) $(-1, 0)$ (D) $(0, 2)$

8. The value of $\sqrt{3}\cos^2 A + \sqrt{3}\sin^2 A$ is:

(A) 1 (B) $\frac{1}{\sqrt{3}}$ (C) $\sqrt{3}$ (D) 0

9. A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, the number of tickets she has bought is:

(A) 40 (B) 240 (C) 480 (D) 750

10. The area of a sector of angle p° of a circle of radius R is:

(A) $\frac{p}{360} \times \pi R^2$ (B) $\frac{p}{180} \times \pi R^2$ (C) $\frac{p}{720} \times 2\pi R$ (D) $\frac{p}{360} \times 2\pi R$

11. The total surface area of a solid hemisphere of radius 7 cm is:

(A) 147π cm^2 (B) 98π cm^2 (C) 49π cm^2 (D) 196π cm^2

12. The mean of the following data is:

x	10	20	30	40	50
f	2	3	5	3	2

(A) 30 (B) 25 (C) 35 (D) 32

13. A card is drawn at random from a well-shuffled deck of 52 cards. The probability that it is a black king or a red queen is:

(A) $\frac{1}{13}$ (B) $\frac{1}{26}$ (C) $\frac{2}{13}$ (D) $\frac{1}{52}$

14. If $(5, -2)$ is the mid-point of the line segment joining $\left(\frac{x}{2}, \frac{y+1}{2}\right)$ and $(x+1, y-3)$, then x and y are respectively:

(A) $6, -1$ (B) $-1, 6$ (C) $6, 1$ (D) $4, -1$

15. Four quadrants of radius 7 cm are drawn with centres at the four corners of a square of side 14 cm. The area of the square not covered by the quadrants is:

(A) 42 cm^2 (B) 154 cm^2 (C) 196 cm^2 (D) 56 cm^2

16. The class marks of a distribution are 47, 52, 57, 62 and 67. The class size and the upper limit of the last class are respectively:

(A) 5, 69.5 (B) 5, 72 (C) 10, 69.5 (D) 4, 69

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17. A kite is flying at a height of 60 m above the ground. The string attached to it is temporarily tied to a point on the ground and is inclined at 60° to the ground. The length of the string, assuming it is taut, is:

(A) $40\sqrt{3}$ m (B) 120 m (C) $60\sqrt{3}$ m (D) $30\sqrt{3}$ m

18. Three coins are tossed together. The probability of getting at least two heads is:

(A) $\frac{1}{2}$ (B) $\frac{3}{8}$ (C) $\frac{1}{4}$ (D) $\frac{7}{8}$

*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 triangle with vertices $(-2, 0)$, $(2, 0)$ and $(0, 2)$ is an isosceles right triangle.
Reason (R) : Its two sides are equal and the square of its third side equals the sum of the squares of the other two sides.

20. *Assertion (A) :* The sum of the first n odd natural numbers is n^2.
Reason (R) : The sum of the first n terms of an A.P. is $S_n = \frac{n}{2}[2a + (n-1)d]$.

SECTION B

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

21. (a) Express 156 and 208 as products of their prime factors and hence find their HCF.

OR

(b) If $a = x^3y^2$ and $b = xy^3$, where x and y are prime numbers, find HCF(a, b) and LCM(a, b).

22. (a) In $\triangle ABC$, D and E are points on AB and AC with $AD = 4$ cm, $DB = 6$ cm, $AE = 2$ cm and $EC = 3$ cm. Show that $DE \parallel BC$ and find DE if $BC = 15$ cm.

OR

(b) The perimeters of two similar triangles ABC and DEF are 30 cm and 18 cm. If $BC = 9$ cm, find EF.

23. If $3\cot A = 4$, check whether $\frac{1 - \tan^2 A}{1 + \tan^2 A} = \cos^2 A - \sin^2 A$.

24. A horse is tied to a peg at one corner of a square-shaped grass field of side 15 m by a rope 5 m long. Find the area of the field over which the horse can graze. (Use $\pi = 3.14$)

25. One card is drawn from a well-shuffled deck of 52 cards. Find the probability that it is (i) a face card, (ii) neither a heart nor a king.

SECTION C

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

26. If p is a prime number, prove that $\sqrt{p}$ is irrational.

27. If α and β are the zeroes of the polynomial $x^2 - 6x + k$ such that $3\alpha + 2\beta = 20$, find the value of k.

28. (a) Find the sum of all multiples of 7 lying between 500 and 900.

OR

(b) The first and last terms of an A.P. are 17 and 350 and its common difference is 9. Find the number of terms and their sum.

29. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

30. Find the coordinates of the points of trisection of the line segment joining $(4, -1)$ and $(-2, -3)$.

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

OR

(b) Prove that: $(\sec A-\tan A)^2=\dfrac{1-\sin A}{1+\sin A}$

SECTION D

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

32. A pole has to be erected at a point on the boundary of a circular park of diameter 13 m such that the difference of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 m. Is it possible? If yes, at what distances from the two gates should the pole be erected?

33. State and prove the Basic Proportionality Theorem. Using it, prove the following: In $\triangle PQR$, A is a point inside it; D, E, F are points on PA, PQ, PR with $DE \parallel AQ$ and $DF \parallel AR$. Prove that $EF \parallel QR$.

34. (a) A medicine capsule is in the shape of a cylinder with two hemispheres stuck to its ends. The length of the entire capsule is 14 mm and its diameter is 5 mm. Find its surface area and volume.

OR

(b) A tent is in the shape of a cylinder of height 2.1 m and base diameter 4 m, surmounted by a cone of the same base with slant height 2.8 m. Find the area of canvas used and its cost at ₹ 500 per m^2. (The base is not covered.)

35. (a) A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked.

OR

(b) A TV tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of its top is 60°. From another point 20 m away from this point, on the line joining it to the foot of the tower, the angle of elevation is 30°. Find the height of the tower and the width of the canal.

SECTION E

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

36. Sanjitha's shot-put throw initially reached 7.56 m. By regular practice she improves the distance by 9 cm every week. During a special 15-day camp she started with 40 throws on the first day and increased the number of throws by 12 every day. Based on the above information, answer the following questions:

(i) How many throws did she practise on the 11^{th} day of the camp? *1*

(ii) What would be her throw distance at the end of 6 weeks? *1*

(iii) (a) How many throws did she do during the entire camp of 15 days? *2*

OR

(iii) (b) After how many weeks will she be able to achieve a throw of 11.16 m? *2*

37. The roof truss of a shed is a triangle ABC. A horizontal beam DE joins D on AB to E on AC and is parallel to the base BC. Based on the above information, answer the following questions:

(i) Name the theorem that relates $\frac{AD}{DB}$ and $\frac{AE}{EC}$. *1*

(ii) If $AD = 1.5$ m, $DB = 3$ m and $AE = 1.8$ m, find EC. *1*

(iii) (a) With the measurements in (ii), if $DE = 2$ m, find BC. *2*

OR

(iii) (b) If $AD : DB = 1 : 2$ and $AC = 6$ m, find AE and EC. *2*

38. In a lucky draw, cards numbered 1 to 50 are placed in a box and one card is drawn at random. Based on the above information, answer the following questions:

(i) Find the probability that the number is a multiple of 5. *1*

(ii) Find the probability that the number is a perfect square. *1*

(iii) (a) Find the probability that the number is a prime number. *2*

OR

(iii) (b) Find the probability that the number is divisible by 2 or 3. *2*

• • • End of Question Paper • • •

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