CBSE Class 9 Mathematics

Sample Question Paper 2026-27 (Set 1)

Subject: Mathematics | **Class:** IX | **Textbook:** Ganita Manjari **Time Allowed:** 3 Hours | **Maximum Marks:** 80

Prepared by Sunbeam World School for practice. Based on the CBSE Class IX curriculum 2026-27 and the prescribed NCERT textbook.

General Instructions

1. This question paper contains **38 questions**. All questions are compulsory.
2. The paper is divided into **five Sections: A, B, C, D and E**.
3. **Section A** has 20 questions of 1 mark each, including two Assertion and Reason questions.
4. **Section B** has 5 questions of 2 marks each.
5. **Section C** has 6 questions of 3 marks each.
6. **Section D** has 4 questions of 5 marks each.
7. **Section E** has 3 case-based questions of 4 marks each.
8. Internal choice is provided in 2 questions of Section B, 2 questions of Section C, 2 questions of Section D and all questions of Section E.
9. Draw neat figures wherever required. Take **π = 22/7** unless stated otherwise.
10. Use of a calculator is **not** permitted.

Blueprint: Unit-Wise Distribution

Unit	Unit Name	Marks
I	Number System	7
II	Algebra	20
III	Coordinate Geometry	4
IV	Geometry	25
V	Mensuration	14
VI	Statistics and Probability	10
	Total	**80**

Question type	Marks	Share
Competency focused (case based, application, assertion reason)	40	50%
Select response (MCQ)	16	20%
Constructed response (short and long answer)	24	30%

SECTION A

20 questions of 1 mark each

1. Which of the following is an irrational number? (a) $\sqrt{16}$ (b) $\sqrt{12}$ (c) 0.25 (d) 7/8

2. The decimal expansion of 3/8 is (a) terminating (b) non-terminating repeating (c) non-terminating non-repeating (d) none of these

3. The degree of the polynomial $5x^3 - 4x^2 + 7x - 2$ is (a) 1 (b) 2 (c) 3 (d) 0

4. The zero of the polynomial $p(x) = 2x + 3$ is (a) 3/2 (b) −3/2 (c) 2/3 (d) −2/3

5. The next term of the sequence 2, 5, 8, 11, … is (a) 13 (b) 14 (c) 15 (d) 16

6. If $x + 1/x = 5$, then $x^2 + 1/x^2$ equals (a) 23 (b) 25 (c) 27 (d) 10

7. The expression $(x + y)^2 - (x - y)^2$ simplifies to (a) $2xy$ (b) $4xy$ (c) $2x^2$ (d) $2y^2$

8. The angles of a triangle are in the ratio 2 : 3 : 4. The largest angle is (a) 40° (b) 60° (c) 80° (d) 90°

9. In a parallelogram ABCD, if $\angle A = 70°$, then $\angle B$ equals (a) 70° (b) 110° (c) 20° (d) 90°

10. The diagonals of a rhombus (a) are equal (b) bisect each other at right angles (c) are perpendicular but unequal in halves (d) do not bisect each other

11. The angle subtended by a diameter at any point on the circle is (a) 45° (b) 60° (c) 90° (d) 180°

12. The sum of the interior angles of a quadrilateral is (a) 180° (b) 270° (c) 360° (d) 540°

13. The converse of the statement "If a quadrilateral is a square, then it is a rectangle" is (a) If a quadrilateral is a rectangle, then it is a square (b) If a quadrilateral is not a square, then it is not a rectangle (c) If a quadrilateral is not a rectangle, then it is not a square (d) Every rectangle is a square

14. In triangle ABC, if AB = AC and $\angle B = 50°$, then $\angle A$ equals (a) 50° (b) 65° (c) 80° (d) 100°

15. The area of a triangle with base 10 cm and height 6 cm is (a) 60 cm^2 (b) 30 cm^2 (c) 16 cm^2 (d) 15 cm^2

16. The surface area of a sphere of radius r is (a) πr^2 (b) $2\pi r^2$ (c) $3\pi r^2$ (d) $4\pi r^2$

17. The volume of a cylinder of radius 7 cm and height 10 cm is (a) 1540 cm^3 (b) 440 cm^3 (c) 770 cm^3 (d) 2200 cm^3

18. The mean of the first five even natural numbers is (a) 5 (b) 6 (c) 10 (d) 4

19. Assertion and Reason. Assertion (A): The polynomial $x^2 - 4$ has two zeroes, 2 and −2. **Reason (R):** A polynomial of degree n has at most n zeroes. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false but R is true

20. Assertion and Reason. Assertion (A): The total surface area of a cube of edge 4 cm is 96 cm^2. **Reason (R):** The total surface area of a cube of edge a is $6a^2$. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false but R is true

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SECTION B

5 questions of 2 marks each

21. Represent $\sqrt{5}$ on the number line. **OR** Simplify: $(3 + \sqrt{3})(3 - \sqrt{3})$ and state whether the result is rational or irrational.

22. Factorise: $x^2 + 9x + 20$.

23. In a circle of radius 5 cm, a chord AB is 8 cm long. Find the perpendicular distance of the chord from the centre.

24. The radius of a sphere is 7 cm. Find its total surface area. **OR** Find the area of an equilateral triangle of side 8 cm. (Take $\sqrt{3} = 1.73$)

25. Find the median of the data: 12, 15, 10, 18, 14, 20, 16.

SECTION C

6 questions of 3 marks each

26. Express $0.\overline{3}$ (0.333…) in the form p/q, where p and q are integers and $q \neq 0$.

27. If $x = 2$ and $x = 0$ are zeroes of the polynomial $p(x) = 2x^3 - 5x^2 + ax + b$, find the values of a and b. **OR** Factorise: $x^3 - 3x^2 - 9x - 5$.

28. Prove that the perpendicular drawn from the centre of a circle to a chord bisects the chord.

29. ABCD is a parallelogram in which P and Q are the mid-points of sides AB and DC respectively. Show that PBCQ is a parallelogram.

30. The sides of a triangle are 13 cm, 14 cm and 15 cm. Find its area using Heron's formula. **OR** A cone has radius 6 cm and height 8 cm. Find its curved surface area.

31. The marks obtained by 10 students are: 25, 30, 28, 35, 40, 30, 32, 38, 30, 42. Find the mean, median and mode.

SECTION D

4 questions of 5 marks each

32. Factorise completely: $2x^3 + x^2 - 13x + 6$, given that $(x - 2)$ is a factor. **OR** If $a + b + c = 9$ and $ab + bc + ca = 26$, find the value of $a^2 + b^2 + c^2$. Hence find $a^3 + b^3 + c^3 - 3abc$.

33. Prove that the diagonals of a parallelogram bisect each other. Using this result, find the coordinates of the point of intersection of the diagonals of a parallelogram whose vertices are A(1, 2), B(5, 2), C(6, 5) and D(2, 5).

34. Prove that equal chords of a circle subtend equal angles at the centre. State the converse and verify it with a labelled figure. **OR** Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

35. A cylindrical water tank of radius 1.4 m and height 2 m is to be painted on the outside, including the top but not the base. Find the area to be painted and the cost of painting at ₹25 per square metre.

SECTION E

3 case-based questions of 4 marks each

36. Case Study: Laying Out a School Garden

A school is designing a rectangular herb garden on a coordinate grid, where each unit represents one metre. The four corner posts are placed at A(2, 3), B(8, 3), C(8, 7) and D(2, 7).

Answer the following: (i) Write the coordinates of the mid-point of side AB. **(1)** (ii) Find the length of side AB and side BC. **(1)** (iii) Find the area of the garden in square metres. **(2) OR** (iii) The gardener wants to run a path along diagonal AC. In which quadrant does the point A lie, and what is the perpendicular distance of point D from the x-axis? **(2)**

37. Case Study: Rainfall Records

The rainfall, in millimetres, recorded in a town over 10 consecutive days was: 12, 15, 18, 15, 20, 22, 15, 18, 25, 20

Answer the following: (i) Find the mode of the rainfall data. **(1)** (ii) Find the range of the data. **(1)** (iii) Find the mean rainfall over the 10 days. **(2) OR** (iii) If a day is chosen at random from these 10 days, find the probability that the rainfall on that day was more than 18 mm. **(2)**

38. Case Study: Packing a Gift Box

A gift box is in the shape of a cuboid of length 20 cm, breadth 15 cm and height 10 cm. It is to be wrapped completely in decorative paper.

Answer the following: (i) Write the formula for the total surface area of a cuboid. **(1)** (ii) Find the total surface area of the box. **(1)** (iii) Find the volume of the box, and the length of the longest straight rod that can be placed inside it. **(2) OR** (iii) If the paper costs ₹2 per 100 cm², find the cost of wrapping one box. **(2)**

MARKING SCHEME

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Marks are shown in brackets. Award full marks for any other correct method.

SECTION A (20 × 1 = 20)

Q	Answer	Marks
1	(b) √12	1
2	(a) terminating	1
3	(c) 3	1
4	(b) −3/2	1
5	(b) 14	1
6	(a) 23	1
7	(b) 4xy	1
8	(c) 80°	1
9	(b) 110°	1
10	(b) bisect each other at right angles	1
11	(c) 90°	1
12	(c) 360°	1
13	(a) If a quadrilateral is a rectangle, then it is a square	1
14	(c) 80°	1
15	(b) 30 cm²	1
16	(d) 4πr²	1
17	(a) 1540 cm³	1
18	(b) 6	1
19	(a) Both A and R are true and R is the correct explanation of A	1
20	(a) Both A and R are true and R is the correct explanation of A	1

Working notes for Section A

- Q6: $(x + 1/x)^2 = x^2 + 2 + 1/x^2 = 25$, so $x^2 + 1/x^2 = 23$.
- Q8: $2x + 3x + 4x = 180°$, $x = 20°$, largest $= 4 \times 20 = 80°$.
- Q14: AB = AC so $\angle B = \angle C = 50°$; $\angle A = 180 - 100 = 80°$.
- Q17: $V = \pi r^2 h = (22/7) \times 49 \times 10 = 1540$ cm³.
- Q18: First five even natural numbers 2, 4, 6, 8, 10; mean = 30/5 = 6.
- Q13: The converse of "if p then q" is "if q then p", so the converse is "If a quadrilateral is a rectangle, then it is a square". Note this converse is false, which is the point of the topic.
- Q20: $TSA = 6a^2 = 6 \times 16 = 96$ cm².

SECTION B (5 × 2 = 10)

21. Correct construction: mark OA = 2 units, draw AB ⊥ OA with AB = 1 unit, join OB so OB = √5, then arc of radius OB cuts the line at √5. **(2)** Construction steps **(1)**, correct marking of √5 **(1) OR** $(3 + \sqrt{3})(3 - \sqrt{3}) = 9 - 3 = 6$ **(1)**; 6 is rational **(1)**

22. $x^2 + 9x + 20 = x^2 + 5x + 4x + 20$ **(1)** $= x(x + 5) + 4(x + 5) = (x + 4)(x + 5)$ **(1)**

23. The perpendicular from the centre bisects the chord, so half the chord = 4 cm **(1)** Distance d = $\sqrt{(5^2 - 4^2)} = \sqrt{9} = 3$ cm **(1)**

24. TSA of sphere = $4\pi r^2 = 4 \times (22/7) \times 49$ **(1)** = 616 cm² **(1) OR** Area = $(\sqrt{3}/4)a^2 = (1.73/4) \times 64$ **(1)** = 27.68 cm² **(1)**

25. Arranging: 10, 12, 14, 15, 16, 18, 20 **(1)**; n = 7, median = 4th term = 15 **(1)**

SECTION C (6 × 3 = 18)

26. Let x = 0.333… **(1)**; 10x = 3.333…, so 10x − x = 3 **(1)**; 9x = 3, x = 1/3 **(1)**

27. p(0) = b = 0 **(1)** p(2) = 16 − 20 + 2a + b = 0 **(1)**; with b = 0, 2a = 4, a = 2 **(1) OR** x = −1 gives p(−1) = −1 − 3 + 9 − 5 = 0, so (x + 1) is a factor **(1)** Division gives $x^2 - 4x - 5$ **(1)**; = (x − 5)(x + 1), so answer $(x + 1)^2(x - 5)$ **(1)**

28. Correct figure: circle with centre O, chord AB, OM ⊥ AB **(1)** Join OA and OB. In △OAM and △OBM: OA = OB (radii), OM common, ∠OMA = ∠OMB = 90° **(1)** △OAM ≅ △OBM by RHS, hence AM = BM by CPCT, so OM bisects AB **(1)**

29. AB = DC and AB ∥ DC (opposite sides of parallelogram) **(1)** P and Q are mid-points, so PB = ½AB and QC = ½DC, giving PB = QC **(1)** PB ∥ QC and PB = QC, so PBCQ is a parallelogram **(1)**

30. s = (13 + 14 + 15)/2 = 21 **(1)** Area = $\sqrt{[21 \times 8 \times 7 \times 6]}$ **(1)** = $\sqrt{7056}$ = 84 cm² **(1) OR** l = $\sqrt{(6^2 + 8^2)}$ = 10 cm **(1)**; CSA = $\pi rl = (22/7) \times 6 \times 10$ **(1)** = 188.57 cm² approx **(1)**

31. Mean = 330/10 = 33 **(1)** Arranged: 25, 28, 30, 30, 30, 32, 35, 38, 40, 42; median = (30 + 32)/2 = 31 **(1)** Mode = 30, as it occurs three times **(1)**

SECTION D (4 × 5 = 20)

32. Dividing $2x^3 + x^2 - 13x + 6$ by (x − 2) gives $2x^2 + 5x - 3$ **(2)** $2x^2 + 5x - 3 = 2x^2 + 6x - x - 3$ **(1)** = 2x(x + 3) − 1(x + 3) = (2x − 1)(x + 3) **(1)** Complete factorisation: (x − 2)(2x − 1)(x + 3) **(1) OR** $a^2 + b^2 + c^2 = (a + b + c)^2 - 2(ab + bc + ca) = 81 - 52$ **(2)** = 29 **(1)** $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca) = 9(29 - 26)$ **(1)** = 27 **(1)**

33. Correct figure, parallelogram ABCD with diagonals meeting at O **(1)** In △AOB and △COD: AB = CD, ∠OAB = ∠OCD and ∠OBA = ∠ODC (alternate angles) **(1)** △AOB ≅ △COD by ASA, hence OA = OC and OB = OD **(1)** Diagonals bisect each other, so the point of intersection is the mid-point of AC **(1)** Mid-point of A(1, 2) and C(6, 5) = ((1+6)/2, (2+5)/2) = (3.5, 3.5) **(1)**

34. Correct figure with chords AB and CD, AB = CD **(1)** In △AOB and △COD: OA = OC, OB = OD (radii), AB = CD **(1)** △AOB ≅ △COD by SSS **(1)**; hence ∠AOB = ∠COD by CPCT **(1)** Converse: if angles subtended at the centre are equal, the chords are equal; verified by the same congruence used in reverse **(1) OR** Correct figure with arc AB, centre O, point P on remaining circle **(1)** Join PO and produce to Q **(1)** OA = OP so ∠OAP = ∠OPA; exterior angle ∠AOQ = ∠OAP + ∠OPA = 2∠OPA **(1)** Similarly ∠BOQ = 2∠OPB **(1)** Adding, ∠AOB = 2∠APB **(1)**

35. CSA of cylinder = $2\pi rh = 2 \times (22/7) \times 1.4 \times 2$ = 17.6 m² **(2)** Area of top = $\pi r^2 = (22/7) \times 1.4 \times 1.4$ = 6.16 m² **(1)** Total area to paint = 17.6 + 6.16 = 23.76 m² **(1)** Cost = 23.76 × 25 = ₹594 **(1)**

SECTION E (3 × 4 = 12)

36. (i) Mid-point of AB = ((2+8)/2, (3+3)/2) = (5, 3) **(1)** (ii) AB = 8 − 2 = 6 m; BC = 7 − 3 = 4 m **(1)** (iii) Area = 6 × 4 = 24 m² **(2) OR** (iii) A(2, 3) lies in the first quadrant **(1)**; perpendicular distance of D(2, 7) from the x-axis = 7 units **(1)**

37. (i) Mode = 15, occurring three times **(1)** (ii) Range = 25 − 12 = 13 mm **(1)** (iii) Sum = 180; mean = 180/10 = 18 mm **(2) OR** (iii) Days with rainfall more than 18 mm: 20, 22, 25, 20, that is 4 days **(1)**; probability = 4/10 = 2/5 **(1)**

38. (i) TSA of cuboid = 2(lb + bh + hl) **(1)** (ii) = 2(300 + 150 + 200) = 2 × 650 = 1300 cm² **(1)** (iii) Volume = 20 × 15 × 10 = 3000 cm³ **(1)**; longest rod = √(400 + 225 + 100) = √725 ≈ 26.93 cm **(1) OR** (iii) Cost = (1300/100) × 2 **(1)** = ₹26 **(1)**

End of marking scheme.