CBSE Class 10 Mathematics · Sample Paper 3 (2026-27 pattern)

Time: 3 hours · Maximum marks: 80 · CBSE Math Revision (not an official CBSE paper)

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: questions 1–18 are MCQs and questions 19–20 are Assertion–Reason based, 1 mark each.
4. Section B: questions 21–25 are very short answer (VSA) questions of 2 marks each.
5. Section C: questions 26–31 are short answer (SA) questions of 3 marks each.
6. Section D: questions 32–35 are long answer (LA) questions of 5 marks each.
7. Section E: questions 36–38 are case study based questions of 4 marks each, with sub-parts of 1, 1 and 2 marks.
8. There is no overall choice. Internal choice is provided in 2 questions of Section B, 2 of Section C, 2 of Section D and in the 2-mark sub-part of each case study in Section E.
9. Draw neat figures wherever required. Take $\pi = \dfrac{22}{7}$ wherever required, unless stated otherwise.
10. Use of calculators is not allowed.

Section A

20 marks

Questions 1 to 20 carry 1 mark each. Questions 1 to 18 are multiple choice questions (MCQs); questions 19 and 20 are Assertion–Reason based questions.

1. The LCM of two numbers is 14 times their HCF, and the sum of the HCF and the LCM is 600. If one number is 280, the other number is **1**

(a) 40 **(b)** 80
(c) 120 **(d)** 160

2. If α, β are the zeroes of $x^2 - px + 6$ and $\alpha - \beta = 1$, then p is **1**

(a) ± 5 **(b)** 5 only
(c) ± 7 **(d)** 25

3. If the zeroes of $ax^2 + bx + c\ (a \neq 0,\ c \neq 0)$ are reciprocals of each other, then **1**

(a) $b = 0$ **(b)** $c = a$
(c) $a + c = 0$ **(d)** $b = a$

4. The lines $kx - 4y = 3$ and $6x - 12y = 9$ intersect in exactly one point if **1**

(a) $k = 2$ **(b)** $k \neq 2$
(c) $k = -2$ **(d)** $k \neq 3$

5. For real k, the roots of $x^2 - (k+1)x + k = 0$ are **1**

(a) never real **(b)** real for every k
(c) real only when $k > 0$ **(d)** equal for every k

6. The sum of the first n terms of an AP is $3n^2 + 5n$. Its 10th term is **1**

(a) 58 **(b)** 62

(c) 64 **(d)** 350

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7. The 17th term from the end of the AP $7, 10, 13, \ldots, 184$ is **1**

(a) 133 **(b)** 136

(c) 139 **(d)** 55

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8. The points $A(0, 6)$, $B(-5, 3)$ and $C(3, 1)$ are the vertices of **1**

(a) an equilateral triangle **(b)** an isosceles right triangle

(c) a scalene triangle **(d)** no triangle (they are collinear)

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9. $A(1, 2)$, $B(4, 3)$, $C(6, 6)$ and D are the vertices of parallelogram $ABCD$, in order. The coordinates of D are **1**

(a) $(3, 5)$ **(b)** $(9, 7)$

(c) $(-1, 1)$ **(d)** $(3, 4)$

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10. In trapezium $ABCD$, $AB \parallel DC$ and $AB = 3\,DC$. The diagonals meet at O. Then $AO : OC$ is **1**

(a) $1 : 3$ **(b)** $2 : 1$

(c) $3 : 1$ **(d)** $9 : 1$

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11. Two tangents from an external point P to a circle of radius 5 cm are inclined to each other at 60°. The length of each tangent is **1**

(a) 5 cm **(b)** $\dfrac{5}{\sqrt{3}}$ cm

(c) $5\sqrt{3}$ cm **(d)** 10 cm

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12. $\triangle ABC \sim \triangle QRP$. If $\angle A = 50^\circ$ and $\angle B = 60^\circ$, then $\angle P$ is **1**

(a) 50° **(b)** 60°

(c) 70° **(d)** 80°

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13. If $\sin A + \sin^2 A = 1$, then $\cos^2 A + \cos^4 A$ equals **1**

(a) 0 **(b)** $\dfrac{1}{2}$

(c) 1 **(d)** 2

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14. If $x = a\cos\theta$ and $y = b\sin\theta$, then $b^2x^2 + a^2y^2$ equals **1**

(a) ab **(b)** $a^2 + b^2$

(c) a^2b^2 **(d)** a^4b^4

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15. A cylinder, a cone and a hemisphere have the same base radius r, and the cylinder and cone have height r. The ratio of their volumes is **1**

(a) $1 : 2 : 3$ **(b)** $3 : 1 : 2$

(c) $2 : 1 : 3$ **(d)** $3 : 2 : 1$

16. The area of a sector (in cm²) is numerically 3.5 times its arc length (in cm). The radius of the circle is **1**

(a) 1.75 cm **(b)** 3.5 cm

(c) 7 cm **(d)** 14 cm

17. The mean of 20 observations was found to be 15. Later it was found that the observation 25 had been wrongly copied as 45. The correct mean is **1**

(a) 13 **(b)** 14

(c) 16 **(d)** 14.5

18. A letter is chosen at random from the letters of the word VISAKHAPATNAM. The probability that it is a vowel is **1**

(a) $\frac{4}{13}$ **(b)** $\frac{5}{13}$

(c) $\frac{2}{13}$ **(d)** $\frac{8}{13}$

19. In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): Any two triangles whose corresponding angles are equal are congruent.

Reason (R): Two equiangular triangles are similar.

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

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

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

20. In the following question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option. **1**

Assertion (A): The volume of a cone is one-third of the volume of a cylinder with the same base radius and height.

Reason (R): The curved surface area of a cone is one-third of the curved surface area of a cylinder with the same base radius and height.

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

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

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

Section B

10 marks

Questions 21 to 25 are very short answer (VSA) type questions carrying 2 marks each. Internal choice is provided in 2 questions.

21. Find the least natural number which leaves a remainder of 7 when divided by each of 12, 16 and 24, and which is itself divisible by 11. **2**

22. The zeroes of $x^2 + px + q$ are double the zeroes of $2x^2 - 5x - 3$. Find p and q. **2**

OR

Find two consecutive positive multiples of 5 whose product is 750.

23. If $\sqrt{3}\tan\theta = 3\sin\theta$, where θ is acute, find the value of $\sin^2\theta - \cos^2\theta$. **2**

24. A chord of a circle of radius 14 cm subtends a right angle at the centre. Find the difference between the areas of the major and the minor segments. $\left(\pi = \frac{22}{7}\right)$ **2**

25. A bag contains only red and white balls, with three times as many red balls as white. When 5 more white balls are added, the probability of drawing a white ball becomes $\frac{1}{3}$. How many balls of each colour were there at first? **2**

OR

All the aces and kings are removed from a deck of 52 playing cards. One card is drawn at random from the remaining cards. Find the probability that it is (i) a face card, (ii) a red card.

Section C

18 marks

Questions 26 to 31 are short answer (SA) type questions carrying 3 marks each. Internal choice is provided in 2 questions.

26. Prove that $\sqrt{2} + \sqrt{3}$ is irrational. (You must prove any irrationality result you use about $\sqrt{6}$.) **3**

27. Meera walks at a steady speed of a km/h and jogs at b km/h. Walking for 2 h and jogging for 1 h, she covers 17 km; walking for 1 h and jogging for 2 h, she covers 22 km. Find a and b. How long must she jog to cover 36 km in all if she walks for 3 h? **3**

28. $ABCD$ is a trapezium with $AB \parallel DC$, $AB = 16$ cm and $DC = 10$ cm. Points E on AD and F on BC are such that $EF \parallel AB$ and $AE : ED = 3 : 2$. Find EF. **3**

29. The incircle of $\triangle ABC$ touches BC, CA, AB at D, E, F. Prove that $BD - DC = AB - AC$. Hence find BD if $AB = 10$ cm, $AC = 7$ cm and $BC = 11$ cm. **3**

30. For an acute angle θ, $\sin\theta - \cos\theta = \frac{7}{13}$. Find the values of $\sin\theta\cos\theta$ and $\sin\theta + \cos\theta$, and hence find $\sec\theta + \operatorname{cosec}\theta$. **3**

OR

Prove that $\frac{\tan A - \sin A}{\tan A + \sin A} = \frac{\sec A - 1}{\sec A + 1}$, and hence find its value when $A = 60^\circ$.

31. A fair spinner with 8 equal sectors numbered 1 to 8 is spun and a fair die is thrown. Find the probability that (i) the sum of the two numbers is 9; (ii) the spinner shows a larger number than the die; (iii) the product of the two numbers is a multiple of 4. **3**

OR

Find the median of the following distribution.

Class	0–10	10–20	20–30	30–40	40–50
Frequency	5	9	15	11	10

Section D

20 marks

Questions 32 to 35 are long answer (LA) type questions carrying 5 marks each. Internal choice is provided in 2 questions.

32. Sneha repays an interest-free education loan of ₹1,18,000 in monthly instalments that form an AP. The first instalment is ₹1000 and each instalment is ₹100 more than the previous one. (a) How many instalments does she pay? (b) Find the last instalment. (c) How much is still due after the 25th instalment? **5**

33. $ABCD$ is a quadrilateral. Points P, Q, R, S lie on AB, BC, CD, DA respectively, with $\frac{AP}{PB} = \frac{AS}{SD} = \frac{1}{2}$ and $\frac{CQ}{QB} = \frac{CR}{RD} = \frac{1}{2}$. (a) Prove that $PS \parallel BD$ and $PS = \frac{1}{3}BD$. (b) Prove that $QR \parallel BD$, $QR = \frac{1}{3}BD$, and hence that $PQRS$ is a parallelogram. (c) If $BD = 18$ cm and $AC = 24$ cm, find the perimeter of $PQRS$. **5**

OR

Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using it: PA and PB are tangents from P to a circle with centre O and radius r, and $\angle APB = 120^\circ$. Prove that $OP = \frac{2r}{\sqrt{3}}$, and show that the chord AB equals r.

34. A helicopter H hovers vertically above a point F on level ground. Two observers A and B, on the same side of F and in line with it, are 200 m apart. The angles of elevation of H from A and B are 60° and 30° respectively. Find (a) the height of the helicopter, (b) the distances FA and FB, (c) the distance AH. (Take $\sqrt{3} = 1.73$.) **5**

OR

Two vertical poles stand $60\sqrt{3}$ m apart on level ground. From the mid-point P of the line joining their feet, the angle of elevation of the top of the shorter pole is 30° and that of the taller pole is 60°. Find (a) the heights of the two poles, (b) the distance between their tops.

35. A school trophy is a solid cube of edge 10 cm with a solid hemisphere of diameter 7 cm fixed centrally on its top face. $\left(\pi = \frac{22}{7}\right)$ (a) Find the total surface area of the trophy. (b) The hemisphere is gold-plated at ₹5 per cm² and the rest of the surface (including the base) is silver-plated at ₹2 per cm². Find the total cost. (c) Find the volume of the trophy. **5**

Section E

12 marks

Questions 36 to 38 are case study based questions carrying 4 marks each (1 + 1 + 2). Internal choice is provided in the 2-mark sub-part of each case study.

36. **Delivery times.** A food-delivery company in Bengaluru recorded the delivery times of 100 orders. Two frequencies were lost from the record, but the median delivery time is known to be 36 minutes. **4**

Time (min)	10–20	20–30	30–40	40–50	50–60
Orders	8	x	30	y	12

i. Write an equation connecting x and y. *[1 mark]*

ii. Which is the median class? Give a reason. *[1 mark]*

iii. Find x and y. *[2 marks]*

OR

Taking $x = 24$ and $y = 26$, find the modal delivery time. *[2 marks]*

37. **Drone delivery corridor.** A drone-delivery company models a town on a coordinate grid (1 unit = 1 km). Its two depots are at $A(-2, 1)$ and $B(6, 7)$, and drones fly along the straight corridor AB. **4**

i. Find the length of the corridor AB. *[1 mark]*

ii. A relay tower is at the mid-point of AB. Find its coordinates. *[1 mark]*

iii. A charging station C on the x-axis is equidistant from A and B. Find C. *[2 marks]*

OR

Find the ratio in which the y-axis divides the corridor AB, and the point of division. *[2 marks]*

38. **Fitness challenge.** Neha joins a 'run more every day' challenge. She runs 1.5 km on day 1 and increases her distance by 0.25 km every day. **4**

i. How far does she run on day 15? *[1 mark]*

ii. On which day does she first run at least 8 km? *[1 mark]*

iii. Find the total distance she runs in the first 30 days. *[2 marks]*

OR

After how many days will her total distance be 39 km? *[2 marks]*