

# ICSE Class 10 • Mathematics

## Important Questions 2027

Most repeated questions from the last few years of board and sample papers, grouped chapter-wise.

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### Goods and Services Tax (GST)

1. An article which is marked at Rs. 1,200 is available at a discount of 20% and the rate of GST is 18%. The amount of SGST is: (a) Rs. 216.00 (b) Rs. 172.80 (c) Rs. 108.00 (d) Rs. 86.40

Seen in: Sample 2025, 2026

2. The following bill shows the GST rate and the marked price of articles: Rajdhani Departmental Store: (a) Dry fruits (1 kg) marked price Rs. 1200 discount Rs. 100 rate of GST 12%; (b) Packed Wheat flour (5kg) marked price Rs. 286 discount Nil rate of GST 5%; (c) Bakery products marked price Rs. 500 discount 10% rate of GST 12%. Find the total amount to be paid (including GST) for the above bill.

Seen in: Sample 2025, 2026

3. The following bill shows the GST rate and the marked price of articles: Vidhyut Electronics: (a) LED TV set marked price Rs. 12000 quantity 01 rate of GST 28%; (b) MP4 player marked price Rs. 5000 quantity 01 rate of GST 18%. Find the total amount to be paid (including GST) for the above bill.

Seen in: Sample 2023, 2024

### Banking - Recurring Deposit Accounts

4. Radha deposited Rs. 400 per month in a recurring deposit account for 18 months. The qualifying sum of money for the calculation of interest is: (a) Rs. 3,600 (b) Rs. 7,200 (c) Rs. 68,400 (d) Rs. 1,36,800

Seen in: Sample 2025, 2026

5. Mr. Sam has a recurring deposit account and deposits Rs. 600 per month for 2 years. If he gets Rs. 15,600 at the time of maturity, find the rate of interest earned by him.

Seen in: Sample 2025, 2026

### Shares and Dividends

6. Ms. Kaur invested Rs. 8000 in buying Rs. 100 shares of a company paying 6% dividend at Rs. 80. After a year, she sold these shares at Rs. 75 each and invested the proceeds including the dividend received during the first year in buying Rs. 20 shares paying 15% dividend at Rs. 27 each. Find the: (a) dividend received by her during the first year. (b) number of shares she purchased using the total proceeds including the dividend.

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7. The sum of money required to buy 50, Rs. 40 shares at Rs. 38.50 is: (a) Rs. 1,920 (b) Rs. 1,924 (c) Rs. 1,925 (d) Rs. 1,952

Seen in: Sample 2025, 2026

## Linear Inequations

8. Solve the following inequation, write the solution set and represent it on the real number line.  $-6 + 12x/5 \leq 7x/5 - 3 < 2/5 + 2x$ ,  $x \in \mathbb{R}$ .

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9. Given,  $x + 2 \leq x/3 + 3$  and  $x$  is a prime number. The solution set for  $x$  is: (a) empty set (b)  $\{0\}$  (c)  $\{1\}$  (d)  $\{0, 1\}$

Seen in: Sample 2025, 2026

10. The solution set for the inequation  $2x + 4 \leq 14$ ,  $x \in \mathbb{W}$  is: (a)  $\{1, 2, 3, 4, 5\}$  (b)  $\{0, 1, 2, 3, 4, 5\}$  (c)  $\{1, 2, 3, 4\}$  (d)  $\{0, 1, 2, 3, 4\}$

Seen in: Board 2023 · Sample 2023

## Quadratic Equations

11. Solve the quadratic equation  $(x - 2)^2 + 11x - 7 = 0$  and give your answer correct to 3 significant figures.

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12. The roots of quadratic equation  $x^2 - 1 = 0$  are: (a) 0, 0 (b) 1, 1 (c) -1, -1 (d) +1, -1

Seen in: Sample 2025, 2026

13. The roots of equation  $(q - r)x^2 + (r - p)x + (p - q) = 0$  are equal. Prove that:  $2q = p + r$ , that is,  $p$ ,  $q$  and  $r$  are in A.P.

Seen in: Sample 2025, 2026

14. Solve the given equation  $x^2 - 4x - 2 = 0$  and express your answer correct to two places of decimal. (You may use mathematical tables for this question).

Seen in: Sample 2023, 2024

15. The nature of roots of quadratic equation  $3x^2 - 6x - 3 = 0$  are: (a) real and equal (b) real, distinct and rational (c) real, distinct and irrational (d) no real roots

Seen in: Board 2025, 2026

- 16.** Mr. and Mrs. Das were travelling by car from Delhi to Kasauli for a holiday. Distance between Delhi and Kasauli is approximately 350 km (via NH 152D). Due to heavy rain they had to slow down. The average speed of the car was reduced by 20 km/hr and time of the journey increased by 2 hours. Find: (a) the original speed of the car. (b) with the reduced speed, the number of hours they took to reach their destination.

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## Ratio and Proportion

- 17.** A mixture of paint is prepared by mixing 2 parts of red pigments with 5 parts of the base. Using the given information in the following table, find the values of a, b and c to get the required mixture of paint. Parts of red pigment: 2, 4, b, 6; Parts of base: 5, a, 12.5, c. (a)  $a=10, b=10, c=10$  (b)  $a=5, b=2, c=5$  (c)  $a=10, b=5, c=10$  (d)  $a=10, b=5, c=15$

Seen in: Sample 2025, 2026

- 18.** If x, y and z are in continued proportion, prove that:  $x/(y^2 z^2) + y/(z^2 x^2) + z/(x^2 y^2) = 1/x^3 + 1/y^3 + 1/z^3$

Seen in: Sample 2025, 2026

- 19.** Using componendo and dividend, find the value of x, when:  $(x^3 + 3x)/(3x^2 + 1) = 14/13$

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- 20.** Given,  $(a + 2b + x)/(a - 2b + x) = (a + b)^2/(a - b)^2$ ,  $a \neq 0$ . Using properties of proportion, find the value of x.

Seen in: Board 2025 · Sample 2027

- 21.** The given table shows the distance covered and the time taken by a train moving at a uniform speed along a straight track. Distance (in m): 60, 90, y; Time (in sec): 2, x, 5. The values of x and y are: (a)  $x=4, y=150$  (b)  $x=3, y=100$  (c)  $x=4, y=100$  (d)  $x=3, y=150$

Seen in: Board 2024 · Sample 2024

## Factorisation (Remainder and Factor Theorem)

- 22.**  $(x + 2)$  and  $(x + 3)$  are the factors of  $x^3 + 4x^2 + x - 6$ . The third factor of the given polynomial is: (a)  $(x - 1)$  (b)  $(x - 4)$  (c)  $(x + 1)$  (d)  $(x + 4)$

Seen in: Sample 2026, 2027

- 23.** Using Remainder and Factor Theorem, factorise the following polynomial:  $2x^3 + 5x^2 - 28x - 15$ .

Seen in: Sample 2024, 2027

- 24.** While factorizing a given polynomial, using remainder and factor theorem, a student finds that  $(2x + 1)$  is a factor of  $2x^3 + 7x^2 + 2x - 3$ . (a) Is the student's solution correct stating that  $(2x + 1)$  is a factor of the given polynomial? (b) Give a valid reason for your answer. Also, factorize the given polynomial completely.

Seen in: Sample 2025, 2026

- 25.** It is given that  $(x - 2)$  is a factor of polynomial  $2x^3 - 7x^2 + kx - 2$ . Find: (a) the value of  $k$ . (b) hence, factorise the resulting polynomial completely.

Seen in: Board 2024, 2025

## Matrices

- 26.** Given two matrices  $A$  and  $B$ , where  $A = \begin{bmatrix} -1 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 3 & 4 \end{bmatrix}$  then product  $AB$  is: (a)  $\begin{bmatrix} -3 & 8 \end{bmatrix}$  (b) 5 (c)  $\begin{bmatrix} 5 \end{bmatrix}$  (d)  $\begin{bmatrix} -3 & 8 \end{bmatrix}$

Seen in: Sample 2026, 2027

- 27.** Given matrix,  $X = \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix}$  and  $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ , prove that  $X^2 = 4X + 5I$ .

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## Arithmetic and Geometric Progression

- 28.** An Arithmetic Progression (A.P.) has 3 as its first term. The sum of the first 8 terms is twice the sum of the first 5 terms. Find the common difference of the A.P.

Seen in: Sample 2025, 2026

- 29.** The fourth and seventh terms of an Arithmetic Progression (A.P.), are 60 and 114 respectively. Find the: (a) first term and common difference. (b) sum of its first 10 terms.

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## Reflection and Section Formula

- 30.** Use a graph paper for this question taking 2 cm = 1 unit along both axes. (a) Plot  $A(1, 3)$ ,  $B(1, 2)$  and  $C(3, 0)$ . (b) Reflect  $A$  and  $B$  on the  $x$ -axis and name their images as  $E$  and  $D$  respectively. Write down their coordinates. (c) Reflect  $A$  and  $B$  through the origin and name their images as  $F$  and  $G$  respectively. (d) Reflect  $A$ ,  $B$  and  $C$  on the  $y$ -axis and name their images as  $J$ ,  $I$  and  $H$  respectively. (e) Join all the points  $A$ ,  $B$ ,  $C$ ,  $D$ ,  $E$ ,  $F$ ,  $G$ ,  $H$ ,  $I$  and  $J$  in order and name the closed figure so formed.

Seen in: Board 2023, 2025

## Equation of a Straight Line

- 31.** Which of the following equations represents a line equally inclined to the axes? (a)  $2x - 3y + 7 = 0$  (b)  $x - y = 7$  (c)  $x = 7$  (d)  $y = -7$

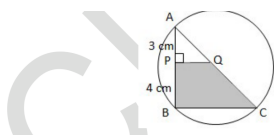
Seen in: Sample 2025, 2026

32. Find the coordinates of the centroid P of the triangle ABC, whose vertices are A(-1, 3), B(3, -1) and C(0, 0). Hence, find the equation of a line passing through P and parallel to AB.

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## Similarity

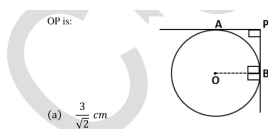
33. In the figure given below, AC is a diameter of the circle. AP = 3 cm and PB = 4 cm and QP perpendicular to AB. If the area of triangle APQ is  $18 \text{ cm}^2$ , then the area of shaded portion QPBC is: (a)  $32 \text{ cm}^2$  (b)  $49 \text{ cm}^2$  (c)  $80 \text{ cm}^2$  (d)  $98 \text{ cm}^2$



Seen in: Sample 2025, 2026

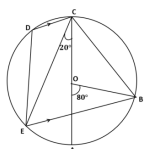
## Circles

34. In the given diagram, the radius of the circle with centre O is 3 cm. PA and PB are the tangents to the circle which are at right angle to each other. The length of OP is: (a)  $\frac{3}{\sqrt{2}} \text{ cm}$  (b) 3 cm (c)  $3\sqrt{2} \text{ cm}$  (d)  $6\sqrt{2} \text{ cm}$



Seen in: Sample 2026, 2027

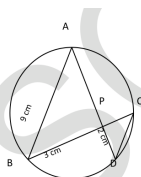
35. In the given figure, AC is the diameter of the circle with centre O. CD is parallel to BE. angle AOB =  $80^\circ$  and angle ACE =  $20^\circ$ . Calculate: (a) angle BEC (b) angle BCD (c) angle CED



[Analysis & Evaluation]

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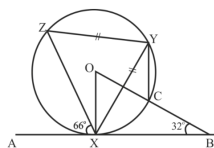
36. In the given figure (not drawn to scale) chords AD and BC intersect at P, where AB = 9 cm, PB = 3 cm and PD = 2 cm. (a) Prove that triangle APB ~ triangle CPD. (b) Find the length of CD. (c) Find area triangle APB : area triangle CPD.



Seen in: Sample 2025, 2026

37. X, Y, Z and C are the points on the circumference of a circle with centre O. AB is a tangent to the circle at X and  $ZY = XY$ . Given angle  $OBX = 32$  and angle  $AXZ = 66$ . Find: (a) angle BOX (b) angle CYX (c) angle ZYX (d) angle OXY

- (a)  $\angle BOX$   
(b)  $\angle CYX$   
(c)  $\angle ZYX$   
(d)  $\angle OXY$



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## Constructions

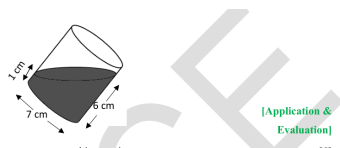
38. Use ruler and compass for the following construction. Construct a triangle ABC, where  $AB = 6$  cm,  $AC = 4.5$  cm and angle  $BAC = 120$ . Construct a circle circumscribing the triangle ABC. Measure and write down the length of the radius of the circle.

Seen in: Board 2023, 2025

## Mensuration - Cylinder, Cone and Sphere

39. In the diagram given below, a tilted right circular cylindrical vessel with base diameter 7 cm contains a liquid. When placed vertically, the height of the liquid in the vessel is the mean of two heights shown in the diagram (7 cm and 6 cm). Find the area of wet surface, when the cylinder is placed vertically on a horizontal surface. (Use  $\pi = \frac{22}{7}$ ).

(Use  $\pi = \frac{22}{7}$ ).



Seen in: Sample 2025, 2026

40. A manufacturing company prepares spherical ball bearings, each of radius 7 mm and mass 4 gm. These ball bearings are packed into boxes. Each box can have a maximum of  $2156 \text{ cm}^3$  of ball bearings. Find the: (a) maximum number of ball bearings that each box can have. (b) mass of each box of ball bearings in kg. (Use  $\pi = \frac{22}{7}$ )

Seen in: Sample 2025, 2026

## Trigonometric Identities

41. Prove the following trigonometric identity:  $(\cos^2 \theta)/(1 - \tan \theta) + (\sin^2 \theta)/(1 - \cot \theta) = 1 + \cos \theta \sin \theta$

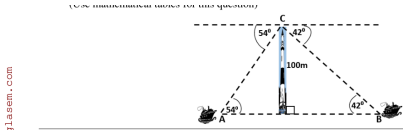
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42. Assertion (A): If  $\sec \theta + \tan \theta = a$  and  $\sec \theta - \tan \theta = b$ , then  $ab = 1$ . Reason (R):  $\sec^2 \theta - \tan^2 \theta = 1$ . (a) A is true and R is false. (b) A is false and R is true. (c) Both A and R are true, and R is the correct explanation for A. (d) Both A and R are true, but R is not the correct explanation for A.

Seen in: Sample 2026, 2027

## Heights and Distances

43. The angle of depression of two ships A and B on opposite sides of a light house of height 100 m are respectively 42° and 54°. The line joining the two ships passes through the foot of the lighthouse. (a) Find the distance between the two ships A and B. (b) Give your final answer correct to the nearest whole number. (Use mathematical tables for this question)



Seen in: Board 2023 · Sample 2024, 2026, 2027

## Statistics - Mean, Median, Mode and Ogive

44. Find the mean of the following frequency distribution using step-deviation method. Take assumed mean = 28. Class Interval: 0-8 (10), 8-16 (20), 16-24 (14), 24-32 (16), 32-40 (18), 40-48 (22).

Seen in: Board 2024, 2026 · Sample 2023, 2024, 2025, 2026

45. The distribution given below represents marks obtained by 200 students in a Mathematics Examination with maximum marks 80. Marks: 0-10 (8), 10-20 (12), 20-30 (16), 30-40 (24), 40-50 (29), 50-60 (38), 60-70 (42), 70-80 (31). Using graph paper draw an ogive for the given distribution. Along one axis take 2 cm equal to 10 marks and along the other axis take 1 cm equal to 10 students. Use your graph to find: (a) Median (b) Number of students who scored above 75 marks (c) If the pass percentage is 35%, find the number of students who scored 35% and below.

Seen in: Sample 2025, 2026, 2027

46. The table given below shows a record of the weight in kilogram of 100 students of a school. Weight (kg): 30-35 (5), 35-40 (7), 40-45 (14), 45-50 (21), 50-55 (25), 55-60 (15), 60-65 (7), 65-70 (6). Draw a histogram and find the modal weight. [Take 2 cm = 5 kg along one axis and 2 cm = 5 students along the other axis]

Seen in: Board 2023, 2025 · Sample 2024, 2027

47. Given that the sum of the squares of the first seven natural numbers is 140, then their mean is: (a) 20 (b) 70 (c) 280 (d) 980

Seen in: Sample 2025, 2026

48. The table given below shows the runs scored by a cricket team during the overs of a match. Overs: 20-30 (37), 30-40 (45), 40-50 (40), 50-60 (60), 60-70 (51), 70-80 (35). Use graph sheet for this question. Take 2 cm = 10 overs along one axis and 2 cm = 10 runs along the other axis. (a) Draw a histogram representing the above distribution. (b) Estimate the modal runs scored.

Seen in: Sample 2023, 2025

## Probability

- 49.** A bag contains 3 red and 2 blue marbles. A marble is drawn at random. The probability of drawing a black marble is: (a) 0 (b)  $\frac{1}{5}$  (c)  $\frac{2}{5}$  (d)  $\frac{3}{5}$

Seen in: Sample 2025, 2026

- 50.** The following letters A, D, M, N, O, S, U, Y of the English alphabet are written on separate cards and put in a box. The cards are well shuffled and one card is drawn at random. What is the probability that the card drawn is a letter of the word, (a) MONDAY? (b) which does not appear in MONDAY? (c) which appears both in SUNDAY and MONDAY?

Seen in: Board 2024 · Sample 2024

- 51.** Ms. Sushmita went to a fair and participated in a game. The game consisted of a box having number cards with numbers from 01 to 30. The three prizes were as per the given table: Wall Clock - perfect square; Water Bottle - even number which is also a multiple of 3; Purse - prime number. Find the probability of winning a: (a) Wall Clock (b) Water Bottle (c) Purse

Seen in: Board 2023, 2025