

Comprehensive Practice Question Bank

ICSE Class 10 Mathematics

Disclaimer: This is a practice question bank designed by subject matter experts to aid students in their exam preparation. It is based on the latest syllabus pattern but is not an official board-issued document.

Commercial Mathematics

1. Goods and Services Tax (GST)

Q1. A shopkeeper bought a washing machine at a discount of 20% from a wholesaler. The printed price of the washing machine is Rs. 18,000. The shopkeeper sells it to a consumer at a discount of 10% on the printed price. If the rate of GST is 12%, find:

- (i) The price inclusive of tax (under GST) which the consumer pays for the washing machine.
- (ii) The amount of tax (under GST) paid by the shopkeeper to the State Government (SGST).

Q2. A dealer in Mumbai supplied some items to a dealer in Pune. The total cost of the items was Rs. 45,000. The dealer in Pune sold these items to a consumer in Goa at a profit of Rs. 8,000. If the rate of GST is 18%, calculate the IGST, CGST, and SGST payable by the dealer in Pune.

2. Banking (Recurring Deposit Accounts)

Q3. Mr. Richard has a recurring deposit account in a bank for 3 years at 8% p.a. simple interest. If he gets Rs. 8,088 as interest at the time of maturity, find the monthly instalment.

Q4. Katrina opened a recurring deposit account with a Nationalised Bank for a period of 2 years. If the bank pays interest at the rate of 6% per annum and the monthly instalment is Rs. 1,000, find the maturity value of this account.

Algebra

3. Linear Inequations

Q5. Solve the following inequation and write down the solution set:

$$11x - 4 < 15x + 4 \leq 13x + 14, \quad x \in \mathbb{W}$$

Represent the solution on a real number line.

Q6. Find the values of x , which satisfy the inequation:

$$-2 \leq \frac{1}{2} - \frac{2x}{3} \leq 1\frac{5}{6}, \quad x \in \mathbb{N}$$

4. Quadratic Equations

Q7. Solve the following quadratic equation for x and give your answer correct to two decimal places:

$$5x^2 - 3x - 4 = 0$$

Q8. A two-digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.

5. Ratio and Proportion

Q9. What number must be added to each of the numbers 6, 15, 20, and 43 to make them proportional?

Q10. Using properties of proportion, solve for x :

$$\frac{\sqrt{a+x} + \sqrt{a-x}}{\sqrt{a+x} - \sqrt{a-x}} = b$$

6. Factorization of Polynomials

Q11. Use the Remainder Theorem to factorize the following expression completely:

$$2x^3 + x^2 - 13x + 6$$

Q12. If $(x-2)$ is a factor of the expression $2x^3 + ax^2 + bx - 14$ and when the expression is divided by $(x-3)$, it leaves a remainder of 52, find the values of a and b .

7. Matrices

Q13. Let $A = \begin{pmatrix} 1 & 2 \\ -2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} -2 & -1 \\ 1 & 2 \end{pmatrix}$. Find matrix C such that $C = A^2 + 2B$.

Q14. Find x and y if:

$$\begin{pmatrix} 2 & -1 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 10 \end{pmatrix}$$

8. Arithmetic Progression (A.P.)

Q15. The 4th term of an A.P. is 22 and the 15th term is 66. Find the first term and the common difference. Hence, find the sum of the first 8 terms of the A.P.

Q16. How many terms of the A.P. 24, 21, 18, 15, ... must be taken so that their sum is 78? Explain the double answer.

Coordinate Geometry

9. Distance, Section Formula, and Equation of a Line

- Q17.** The line segment joining $A(-3, 1)$ and $B(5, -4)$ is a diameter of a circle whose center is C . Find the coordinates of the point C .
- Q18.** Find the equation of a line that passes through the point $(3, 4)$ and is perpendicular to the line $3x - 2y + 5 = 0$.
- Q19.** In what ratio does the point $M(x, 2)$ divide the line segment joining the points $P(5, 3)$ and $Q(-5, 3)$? Also, find the value of x .

Geometry

10. Similarity & Circles

- Q20.** In $\triangle ABC$, $DE \parallel BC$. If $AD = 3$ cm, $DB = 4$ cm, and $AE = 6$ cm, find EC . Also, find the ratio of the area of $\triangle ADE$ to the area of trapezium $DECB$.
- Q21.** In a cyclic quadrilateral $ABCD$, $\angle A = (2x + 4)^\circ$ and $\angle C = (4x - 64)^\circ$. Find the value of x and the measure of $\angle A$.
- Q22.** Two chords AB and CD of a circle intersect internally at a point P . If $AP = 5$ cm, $PB = 6$ cm, and $CP = 3$ cm, find PD .

Mensuration

11. Cylinders, Cones, and Spheres

- Q23.** A solid metallic sphere of radius 6 cm is melted and recast into small solid spheres of radius 2 cm. Find the number of small spheres formed.
- Q24.** A tent is in the shape of a right circular cylinder up to a height of 3 m and conical above it. The total height of the tent is 13.5 m and the radius of its base is 14 m. Find the cost of cloth required to make the tent at the rate of Rs. 80 per square meter. (Take $\pi = \frac{22}{7}$)

Trigonometry

12. Identities, Heights and Distances

- Q25.** Prove the following identity:

$$\frac{\cos A}{1 - \sin A} + \frac{\cos A}{1 + \sin A} = 2 \sec A$$

- Q26.** From the top of a cliff 90 m high, the angles of depression of the top and bottom of a tower are observed to be 30° and 60° respectively. Find the height of the tower.

Statistics & Probability

13. Measures of Central Tendency

Q27. The marks obtained by 120 students in a mathematics test are given below:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	5	15	30	40	20	10

Draw an ogive for the given distribution on a graph sheet and estimate the median marks.

Q28. Calculate the mean of the above distribution using the step-deviation method.

14. Probability

Q29. Two unbiased dice are thrown simultaneously. Find the probability of getting:

- (i) A sum of 8.
- (ii) A doublet.
- (iii) A sum less than 5.

Q30. A bag contains 5 red balls, 8 white balls, 4 green balls, and 7 black balls. If one ball is drawn at random, find the probability that it is:

- (i) Black.
- (ii) Not red.

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Answer Key / Hints (Selected Questions)

- **Q1:** (i) Consumer Price = Rs. 18,144. (ii) SGST paid by shopkeeper = Rs. 108.
- **Q3:** Monthly instalment = Rs. 1,200.
- **Q5:** Solution set: $x \in \{0, 1, 2, 3, 4\}$.
- **Q7:** $x = 1.25$ or $x = -0.65$.
- **Q8:** The number is 27.
- **Q11:** $(x - 2)(2x - 1)(x + 3)$.

- **Q15:** First term $a = 10$, common difference $d = 4$. Sum $S_8 = 192$.
- **Q20:** $x = 40^\circ$. $\angle A = 84^\circ$.
- **Q22:** Number of small spheres = 27.
- **Q25:** Height of the tower = 60 m.
- **Q28:** (i) $5/36$ (ii) $1/6$ (iii) $1/6$.