

class 10 ncert math with solution

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Introduction

Class 10 NCERT Mathematics is the cornerstone of the secondary school curriculum in India. It serves as the bridge between foundational arithmetic and the more advanced concepts encountered in higher grades. For students preparing for board examinations, coaching tests, or simply seeking a deeper understanding of mathematical ideas, having access to reliable solutions is essential. This article offers a detailed guide to the NCERT Class 10 math syllabus, highlights key chapters, presents worked examples, and provides practical strategies to master the subject with confidence.

Why Class /10 NCERT Maths Matters

NCERT Textbooks: A Trusted Resource

The National Council of Educational Research and Training (NCERT) publishes textbooks that are meticulously reviewed and aligned with the national curriculum. The Class 10 maths book is praised for its clear explanations, logical progression, and the inclusion of real world applications. Because the board exams are largely based on NCERT content, mastering this book ensures that students are well prepared for the examination pattern.

Importance of Solving Questions

Learning concepts is only part of the equation. Solving questions consolidates knowledge, builds problem solving skills, and reveals common pitfalls. Class /10 NCERT math with solution sets provide step by step demonstrations that help students understand not just the “what” but also the “why” behind each solution.

Structure of Class /10 NCERT Maths

The textbook is divided into twelve chapters, each tackling a distinct mathematical theme. Below is a brief overview of each chapter, along with a concise solution example to illustrate the type of problems students encounter.

Chapter /1: Sets

Sets introduce the fundamental idea of grouping objects based on common properties. Key topics include the definition of a set, subsets, proper subsets, universal set, and operations such as union, intersection, and complement. A typical problem: “Find the union of $A = \{1, 2, 3\}$ and $B = \{3, 4, 5\}$.” The solution involves listing all unique elements: $\{1, 2, 3, 4, 5\}$.

Chapter /2: Relations and Functions

This chapter covers binary relations, reflexive, symmetric, and transitive properties, and introduces the concept of a function. A common exercise: “Determine whether the relation $R = \{(1,2), (2,3), (3,4)\}$ is transitive.” By checking the definition, we find that $(1,3)$ is missing, so R is not transitive.

Chapter /3: Cartesian Plane

Students learn to plot points, understand coordinates, and interpret geometric figures in the Cartesian plane. A standard question: “Plot the point $(3, -2)$ and determine its quadrant.” The answer: It lies in the fourth quadrant.

Chapter /4: Real Numbers

This chapter explores properties of real numbers, including the density property, the concept of rational and irrational numbers, and the use of the number line. For example, “Prove that between any two real numbers there exists a rational number.” The solution uses the fact that the average of two rationals is rational.

Chapter /5: Polynomials

Students learn about polynomial expressions, degrees, and the factor theorem. A typical problem: “Factorise $x^2 - 9$.” The solution: $(x - 3)(x + 3)$.

Chapter /6: Linear Equations in Two Variables

Here, the focus is on solving simultaneous equations using substitution or elimination. Example: “Solve the system: $2x + 3y = 7$ and $4x - y = 5$.” The solution yields $x = 2$, $y = 1$.

Chapter /7: Linear Inequalities in Two Variables

Students learn to solve inequalities and graph the solution set on a coordinate plane. A typical exercise: “Graph the inequality $2x + y \leq 4$.” The solution involves shading the region below the line $2x + y = 4$.

Chapter /8: Euclid's Division Algorithm

This chapter introduces the algorithm for finding the greatest common divisor (GCD) of two integers. Example: “Find the GCD of 84 and 30.” Using Euclid's algorithm: $84 = 30 \times 2 + 24$, $30 = 24 \times 1 + 6$, $24 = 6 \times 4 + 0$! GCD = 6.

Chapter /9: Applications of Linear Equations in Real Life

Students apply linear equations to solve practical problems such as mixing solutions or calculating costs. Example: “Two types of apples cost ₹120 and ₹180 per kilogram. A basket contains 10 kg of apples costing ₹1500. Find the quantity of each type.” The solution uses a system of equations.

Chapter /10: Triangles

This chapter covers the properties of triangles, the Pythagorean theorem, and the classification of triangles. A common question: “Verify if a triangle with sides 3, 4, 5 is right angled.” Using Pythagoras: $3^2 + 4^2 = 5^2$, confirming a right angled triangle.

Chapter /11: Pythagoras Theorem and its Applications

Students delve deeper into right angled triangles and use the theorem to solve for missing sides or angles. Example: “Find the length of the hypotenuse of a right angled triangle with legs 6 cm and 8 cm.” Solution: $\sqrt{6^2 + 8^2} = 10$ /cm.

Chapter /12: Circles

This chapter introduces the geometry of circles, including radius, diameter, circumference, and area. A typical problem: “Find the area of a circle with radius 7 /cm.” Solution: $\pi r^2 = \pi \times 7^2 = 49\pi$ cm².

Commonly Asked Questions with Solutions

- Question: “Solve for x: $3x + 5 = 20$.”
Solution: $3x = 15$! $x = 5$.
- Question: “Determine if the function $f(x) = x^2$ is one to one.”
Solution: No, because $f(2) = f(-2) = 4$.
- Question: “Find the GCD of 56 and 98.”
Solution: Using Euclid's algorithm: $98 = 56 \times 1 + 42$; $56 = 42 \times 1 + 14$; $42 = 14 \times 3 + 0$! GCD = 14.
- Question: “Calculate the area of a triangle with base 8 /cm and height 5 /cm.”

Solution: $\frac{1}{2} \times 8 \times 5 = 20 \text{ /cm}^2$.

5. Question: "Graph the inequality $y \geq 2x + 1$."

Solution: Plot the line $y = 2x + 1$; shade the region above the line.

Tips for Mastering NCERT Maths

- Read the Chapter Thoroughly: Begin by understanding definitions, theorems, and examples before attempting exercises.
- Practice Regularly: Set aside time each day to solve at least five problems from each chapter.
- Work on Past Papers: Familiarise yourself with the exam pattern and question types.
- Use Visual Aids: Diagrams, tables, and graphs help in visualising problems, especially in geometry and coordinate plane questions.
- Review Mistakes: Keep a log of errors and revisit them to avoid repetition.
- Collaborate: Study groups can provide diverse problem solving approaches.
- Seek Clarifications: Don't hesitate to ask teachers or mentors for explanations on confusing topics.

Online Resources and Practice Platforms

- NCERT Official Website: Provides free PDFs of textbooks and solution manuals.
- BYJU'S: Offers interactive video lessons and quizzes for Class /10 maths.
- Topper Learning: Features chapter wise video tutorials and practice tests.
- Khan Academy: Includes comprehensive lessons on algebra, geometry, and number theory.
- CollegeBoard's AP Calculus Prep: While aimed at higher levels, the foundational concepts reinforce NCERT topics.

Conclusion

Class 10 NCERT Mathematics with solutions is more than a textbook; it is a roadmap that guides students through the essential concepts of algebra, geometry, and number theory. By engaging deeply with each chapter, solving problems methodically, and leveraging online resources, students can build a solid mathematical foundation that will serve them well in higher education and competitive exams. Remember that consistency, curiosity, and a willingness to seek help when needed are the keys to mastering this pivotal subject. Happy studying!

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