Textbook : New Horizon Senior Mathematics Compulsory Part – 4A, 4B & 5A

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Students are expected to develop the following attitudes:
- to love logical thinking
- to accept careful work as important
- to accept challenging work.

Chapter	Topics	Approx. No. of Period	Objectives
1	Real Numbers and Complex Numbers	8	• To appreciate the development of various types of numbers • To learn some basic concepts of complex numbers • To learn the four basic operations of complex numbers • **To prove the irrationality of $\sqrt{2}$ by contradiction.**
2	Functions and Graphs	7	• To recognize the intuitive concepts of functions, independent and dependent variables, domains and co-domains • To recognize the notation of functions and use algebraic, tabular and graphical methods to represent functions • To understand the features of the graphs of constant functions, linear functions and quadratic functions
3	Quadratic Equations in One Unknown	8	• To recognize the general form of a quadratic equation • To understand the factor method for solving quadratic equations • To use the quadratic formula to solve quadratic equations • To use the graphical method to solve quadratic equations • To apply different methods to solve practical problems involving quadratic equations
4	Roots and Coefficients of Quadratic Equations	8	• To understand and apply the concept of discriminant in order to determine the nature of roots of quadratic equations • To understand the relations between the roots and coefficients • To form a quadratic equation with given roots • To form a quadratic equation by the sum of roots and the product of roots
5	Equations of Straight Lines	9	• To find the equations of straight lines under different conditions • To understand the general form of equations of straight lines • To understand the features of straight lines • To understand the possible intersections of two straight lines

6	More about Polynomials	22	• To manipulate the addition, subtraction, multiplication and division of polynomials and to understand the division algorithm • To learn and to apply the remainder theorem • To understand the factor theorem and to apply it in factorization of polynomials up to degree 3 • To understand the concepts of the greatest common divisor and the least common multiple of polynomials • To perform addition, subtraction, multiplication and division of rational functions
7	Exponential and Logarithmic Functions	19	• To understand the definition and the laws of rational indices • To solve exponential equations and logarithmic equations • To understand the definition and the properties of logarithms • To appreciate the applications of logarithms • To understand the properties of exponential functions and logarithmic functions and recognize the features of their graphs
8	Quadratic Functions and Graphs	6	• To find the optimum values of quadratic functions graphically • To understand the method of completing square • To find the optimum values of quadratic functions by the algebraic method • To solve practical problems involving the optimum values of quadratic functions
9	Trigonometry	10	• To understand the concepts of angles and quadrants • To learn the definition of trigonometric ratios and arbitrary angles • To understand the concepts of reference angles and find trigonometric ratios by using reference angles • To use the trigonometric identities to simplify expressions • To understand the functions sine, cosine and tangent, and their graphs and properties • To solve trigonometric equations • To find the graphical solutions of trigonometric equations by reading graphs or adding a suitable straight line on a trigonometric graph
10	Important Formulas in Trigonometry	6	• To study and use the formula $\frac{1}{2}ab\sin C$ for calculating the areas of triangles • To study and use the sine formula to solve oblique triangles • To study and use the cosine formula to solve oblique triangles • To study and apply Heron's formula

11	Variations	12	• To understand direct and inverse variations and their applications to real-life problems • To understand the graphs of direct and inverse variations • To understand joint and partial variations and their applications to real-life problems
14	Basic Properties of Circles	16	• To understand and apply the properties of chords, angles and arcs of a circle • To understand and apply the properties of a cyclic quadrilateral • To understand the tests for concyclic points and cyclic quadrilaterals
			• **Learn to use Intersection Chord Theorem to solve problems.** • **Know to use "prove by contradiction" to prove "the converse of angles in the same segment".**
15	Tangents to Circles	6	• To understand the properties of tangents to a circle • To understand the properties of angles in the alternate segment

Note: Contents in the shaded boxes are not included in the syllabus.

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Signature of Teacher In Charge : _____

Checked by : _____