

6th Maths (O) Course 1

Unit 1: Algebra

- Algebraic Operations on Polynomials & Rational Functions.
- Addition, Subtraction, Multiplication & Division & the use of Brackets & Surds.
- Laws of Indices.
- Factorisation of such Polynomials (The Linear & Quadratic Factors having Integer Coefficient).
- Solution of Cubic Equations with at least One Integer Root.
- Quadratic Equations by Factoring or using the -B Formula.
- Form a Quadratic from its Roots.
- Inequalities with X.
- Solving for X as a Power.

Unit 2: Functions with Differential Calculus

- Differentiation by Rule & First Principles.
- Rules of Sums, Products & Quotients.
- First Derivatives of Polynomials, Rational, Power.
- First Derivatives of Products.
- First Derivatives of Quotients.
- Simple Second Derivatives.
- Maxima & Minima.

Unit 3: Complex Numbers

- Real & Imaginary Part to Complex Numbers.
- Adding/Subtracting Complex Numbers.

- Multiplying Complex Numbers.
- The Conjugate.
- Dividing Complex Numbers.
- Plotting Complex Numbers on a Graph (Argand Diagrams).
- The Modules.
- Quadratic Equations with Complex Numbers.
- Transformations with Complex Numbers.

6th Maths (O) Course 2

Unit 1: Co Ordinate Geometry of the Straight Line & Circle

- General Equation of the Line in Form $-ax + by + c = 0$.
- Length of Perpendicular from (x_1, y_1) to $ax + by + c = 0$.
- Angle Between Two Lines with Slopes m_1 & m_2 .
- Equation Circle Centre $(0,0)$ & Radius r ($x^2 + y^2 = r^2$).
- Equation of Tangent at (x_1, y_1) to $x^2 + y^2 = r^2$.
- Intersection of Line & Specific Circle.

Unit 2:

- Probability of an Outcome with one event happening.
- Probability of an Outcome with two events happening.
- Fundamental Principle of Counting.
- Arrangements – Permutations.
- Expected Frequency.
- Or Rule (Add): Mutually Exclusive Events.
- And Rule/The Multiplication Rule – Bernoulli Trial.
- Tree Diagram.
- Expected Values – Law of Large Numbers.

Unit 3: Trigonometry

- Calculate the Area of a Sector of a Circle & the Length of an Arc & Solve Problems Involving these Calculations.
- Pythagoras Theorem.
- Use Trigonometry to Calculate the Area of a Triangle.

- Use the Sine & Cosine Rules to Solve Problems 2D & 3D.
- Define Sine A, Cos A & Tan A for all values of A.