



DRAVID OPEN SECONDARY AND HIGHER SECONDARY EDUCATION COUNCIL

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SYLLABUS MATHEMATICS

CLASS 12 MATHEMATICS SYLLABUS

Unit I: Relations and Functions

- ❖ Relations & Functions: types of relations (reflexive, symmetric, transitive, equivalence relations), one-one and onto functions, composition of functions.
- ❖ Inverse Trigonometric Functions: definitions, domain, range, principal values, graphs and basic properties.

Unit II: Algebra

- ❖ Matrices: concept, notation, order, types (e.g. zero, identity), equality, transpose, symmetric & skew symmetric, operations (addition, multiplication, scalar multiplication), inverse of matrices, solving linear systems using matrices.
- ❖ Determinants: definition (up to order 3×3), minors & cofactors, properties, adjoint & inverse of square matrices, using determinants in solving linear equations, area of triangle via determinants.

Unit III: Calculus

- ❖ Continuity & Differentiability: limit, continuity, differentiability, derivative of functions including composite, implicit, inverse trigonometric, exponential & logarithmic; chain rule; parametric forms.
- ❖ Applications of Derivatives: rate of change, increasing / decreasing functions, maxima & minima (first and second derivative tests), tangents & normals.
- ❖ Integrals: integration as inverse of differentiation, methods (substitution, parts, partial fractions), definite integrals, basic properties.
- ❖ Applications of Integrals: area under curves, area between curves, especially with lines, circles, parabolas, ellipses in standard forms.
- ❖ Differential Equations: order, degree; methods of solving (separation of variables; homogeneous linear equations; linear equations of first order of type $dy/dx + p y = q$).

Unit IV: Vectors & Three-Dimensional Geometry

- ❖ Vectors: scalars vs vectors, magnitude & direction; direction cosines/ratios; position vectors; addition, scalar multiplication; dot product (scalar product) & cross product (vector product).
- ❖ Three-Dimensional Geometry: lines & planes in 3D; direction cosines/ratios of line joining two points; Cartesian and vector equations of line and plane; skew lines; angle between lines, planes, line & plane; shortest distance between lines; distance of point from a plane.

Unit V: Linear Programming

- ❖ Linear Programming: related terminology (constraints, objective function etc.), formulation of problems, graphical method of solution (for two variables), feasible / infeasible regions, optimal feasible solution.

Unit VI: Probability

- ❖ Probability: conditional probability, independent events, multiplication theorem, total probability theorem, Bayes' theorem.
- ❖ Random variable & its probability distribution, mean (expected value) & variance of random variables; Bernoulli trials and Binomial distribution