

**MONTHLY SYLLABUS**  
**SESSION-2017-18**  
**CLASS XII**  
**SUBJECT : MATHEMATICS**

MONTH	CONTENTS
April 2017	<p><b>Matrices</b> : Concept, notation, order equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices: Addition and Multiplication and Multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutability of multiplication of matrices and existence of non-zero matrices whose product is null matrix (restrict to square matrices of order (2).) Concept of elementary row and column operations. Invertible matrices and proof of uniqueness of inverse, it exists; (Here all matrices will have real entries)</p> <p><b>Determinates:</b></p> <p>Determinants of square matrix (upto 3 x 3 order) properties of, determinants, minors, co-factors and applications of determinants in finding the area of triangle. Adjoint and inverse of a square matrix. Properties of inverse of a matrix. Consistency, inconsistency and number of solutions of system of linear equations in two or three variables (having unique solution ) using inverse of matrix</p> <p><b>Inverse Trigonometric Function :</b></p> <p>Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric function.</p> <p><b>YUVA Session</b> : Towards better understanding of gender and sex</p>

<p>May 2017</p>	<p><b>Relations and Functions:</b> Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.</p> <p><b>Continuity and Differentiability:</b> Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions</p>
<p>July 2017</p>	<p><b>Continuity and Differentiability:</b></p> <p>Derivative of implicit functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretation.</p> <p><b>Applications of Derivatives:</b></p> <p>Applications of derivatives: rate of change of bodies, increasing/decreasing functions, tangents and normals, use of derivatives in approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).</p> <p><b>Integrals:</b> Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts.</p> <p><b>YUVA SESSION:</b> Let everyone live</p>
<p>August 2017</p>	<p><b>Integrals:</b> Evaluation of simple integrals of the following types and problems based on them.</p>

	$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}}$ $\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx, \int \sqrt{a^2 \pm x^2} dx, \int \sqrt{x^2 - a^2} dx$ $\int \sqrt{ax^2 + bx + c} dx, \int (px + q) \sqrt{ax^2 + bx + c} dx$ <p>Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.</p> <p><b>Applications of the Integrals:</b></p> <p>Applications in finding the area under simple curves, especially lines, circles/parabolas/ellipses (in standard form only), Area between any of the two above said curves (the region should be clearly identifiable).</p> <p><b>Differential Equations:</b></p> <p>Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables solutions of homogeneous differential equations of first order and first degree.</p> <p><b>YUVA SESSION:</b> Towards responsible relationships</p>
September 2017	<p>Solutions of linear differential equation of the type:</p> <p><math>dy/dx + py = q</math>, where p and q are functions of x or constants.</p> <p><math>dx/dy + px = q</math>, where p and q are functions of y or constants.</p> <p>Revision of first term syllabus</p>
	<b>First Term Exams</b>
	<b>Second Term</b>
October 2017	Discussion of first term question paper

	<p><b>Vectors:</b></p> <p>Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors, scalar triple product of vectors.</p> <p><b>Three - dimensional Geometry:</b></p> <p>Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes, (iii) a line and a plane. Distance of a point from a plane.</p> <p><b>YUVA SESSION:</b> Assessing career options</p>
November 2017	<p><b>Linear Programming:</b></p> <p>Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions(bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints)</p> <p><b>Probability:</b></p> <p>Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean and variance of</p>

	<p>random variable. Repeated independent (Bernoulli) trials and Binomial distribution</p> <p><b>YUVA SESSION:</b> Let not the newborns die</p>
December 2017	<p>Revision of mock test syllabus</p> <p>Mock test, discussion of mock test question paper</p> <p>Revision of unit 3,4,5,7 and 8</p> <p>Discussion of CBSE sample paper</p>
January 2018	<p>Winter vacation</p> <p>Common pre board school examination 2017-18</p> <p>Discussion of pre board question paper</p> <p>Revision of chapters 1-4 with support material</p>
February 2018	<p>Revision of chapters 5-9 with support material</p> <p>Revision of chapters 10-13 with support material</p> <p>Practice questions from last 5 year CBSE question paper</p> <p>Discussion of doubts of students</p>
March 2018	Board Examination