KOTHARI INTERNATIONAL SCHOOL , NOIDA

ANNUAL ACADEMIC PLAN- A LEVEL

SUBJECT: MATHEMATICS SESSION: 2023-24

NAME OF THE TEACHER: JAGRITI KALRA

MONTH	CHAPTERS AND CONCEPTS TO BE COVERED	LEARNING OBJECTIVES
MARCH	**Chapter - 1** **ALGEBRA**	Learners should be able to: Understand the meaning of |x| , sketch the graph of y =|a + x b| and use relations such |a| = |b| and |x- a| < b ⇔ a-b<x<a+b , in the course of solving equations and inequalities ■ divide a polynomial, of degree not exceeding 4, by a linear or quadratic polynomial, and identify the quotient and remainder (which may be zero) ■ use the factor theorem and the remainder theorem
APRIL	**Chapter - 2** **LOGARITHMIC & EXPONENTIAL FUNCTIONS**	Learners should be able to: Understand the relationship between logarithms and indices, and use the laws of logarithms (excluding change of base) ■ understand the definition and properties of exponential and ln x, including their relationship as inverse functions and their graphs ■ use logarithms to solve equations and inequalities in which the unknown appears in indices ■ use logarithms to transform a given relationship to linear form, and hence determine unknown constants by considering the gradient and/or intercept.
	Chapter - 3 **TRIGONOMETRY**	Learners should be able to: Understand the relationship of the secant, cosecant and cotangent functions to cosine, sine and tangent, and use properties and graphs of all six trigonometric functions for angles of any magnitude ■ use trigonometric identities for the simplification and exact evaluation of expressions and in the course of solving equations, and select an identity or identities appropriate to the context, showing familiarity in particular with the use of: • the expansion of sin(A ± B), cos(A ± B) and tan(A ± B)

MAY	**Chapter - 4** **DIFFERENTIATION**	In the student should be able to learn about: Differentiate products and quotients ■ use the derivatives of exponential , ln , sin , cos , tan , together with constant multiples, sums, differences and composites ■ find and use the first derivative of a function, which is defined parametrically or implicitly
	Chapter - 5 **INTEGRATION**	Student should be able to extend the idea of 'reverse differentiation' to include the integration of e^ ax +b sin(ax b +), cos(ax b +) and sec (ax b +) ■ use trigonometric relationships in carrying out integration ■ understand and use the trapezium rule to estimate the value of a definite integral.
	Chapter - 6 **NUMERICAL SOLUTIONS OF EQUATIONS**	In this chapter students should be able to ■ locate approximately a root of an equation, by means of graphical considerations and/or searching for a sign change ■ understand the idea of, and use the notation for, a sequence of approximations that converges to a root of an equation ■ understand how a given simple iterative formula of the form + = F( ) x x n n 1 relates to the equation being solved, and use a given iteration, or an iteration based on a given rearrangement of an equation, to determine a root to a prescribed degree of accuracy.
JUNE **SUMMER VACATION**		
JULY	**Chapter - 7** **FURTHER ALGEBRA**	In this chapter students will get the understanding to recall an appropriate form for expressing rational functions in partial fractions, and carry out the decomposition, in cases where the denominator is no more complicated than: • (ax + b)(cx+d)(ex+f) •(ax+b)(cx+d)^2 •(ax+b)(cx^2+d) ■ use the expansion of (1 + x) n , where n is a rational number and |x| < 1 .
	Chapter - 8 **FURTHER CALCULUS**	In this chapter students will get the understanding to ■ use the derivative of tan inverse x ■ extend the ideas of 'reverse differentiation' to include the integration of 1/(x^2+a^2)

		■ recognise an integrand of the form k f'(x)/f(x) , and integrate such functions ■ use a given substitution to simplify and evaluate either a defi nite or an indefi nite integral ■ integrate rational functions by means of decomposition into partial fractions ■ recognise when an integrand can usefully be regarded as a product, and use integration by parts.
AUGUST	**Chapter - 9** **VECTORS**	Students should be able to: ■ use standard notations for vectors, in two dimensions and three dimensions ■ add and subtract vectors, multiply a vector by a scalar and interpret these operations geometrically ■ calculate the magnitude of a vector and find and use unit vectors ■ use displacement vectors and position vectors ■ find the vector equation of a line ■ find whether two lines are parallel, intersect or are skew ■ find the common point of two intersecting lines ■ find and use the scalar product of two vectors.
	Chapter - 10 **DIFFERENTIAL EQUATIONS**	In this chapter students will learn how to: •formulate a simple statement involving a rate of change as a differential equation ■ find, by integration, a general form of solution for a first order differential equation in which the variables are separable ■ use an initial condition to find a particular solution ■ interpret the solution of a differential equation in the context of a problem being modeled by the equation .
	Chapter - 11 **COMPLEX NUMBERS**	In this chapter students will learn how to: ■ understand the idea of a complex number, recall the meaning of the terms real part, imaginary part, modulus, argument and conjugate and use the fact that two complex numbers are equal if and only if both real and imaginary parts are equal ■ carry out operations of addition, subtraction, multiplication and division of two complex numbers expressed in Cartesian form x +iy ■ use the result that, for a polynomial equation with real coefficients, any non-real roots occur in conjugate pairs ■ represent complex numbers geometrically by means of an Argand diagram

		■ carry out operations of multiplication and division of two complex numbers expressed in polar form ■ find the two square roots of a complex number ■ understand in simple terms the geometrical effects of conjugating a complex number and of adding, subtracting, multiplying and dividing two complex numbers ■ illustrate simple equations and inequalities involving complex numbers by means of loci in an Argand diagram.
SEPTEMBER	**MOCK/ HALF YEARLY EXAMINATION**	
REVISION FOR BOARD EXAMINATION		