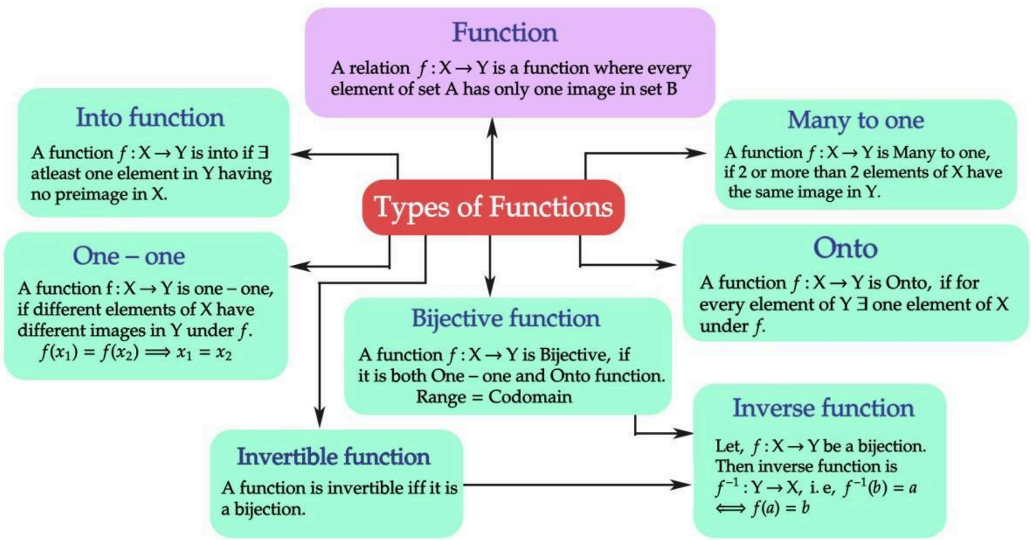
VIDYA PRATISHTHAN'S

DR. CYRUS POONAWALLA SCHOOL(CBSE), BARAMATI

ANNUAL CURRICULUM PLANNING, 2024-25

Subject : Mathematics(041)

Class : XII **Marks: 100**

Sr. No.	Content/ Topic	Month & No. of Days	21st Century Skills	Learning Objectives	Expected Learn Outcome
1	Relations and Functions 	March- 14 Days	Through problems based on Relations and functions they will Develop: 1)Logical thinking 2)Critical thinking 3)Imagination	To enable the students to understand the role of Relations and Functions Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto and bijective functions.	Students learnt abo Equivalence relatio bijective functions. Different types of relations and functi
2	Inverse Trigonometric Functions	March-09D ays April–03 Days	Through approach adopted for problems students will attain 1)Imagination 2)Systematic approach	Students will be able to find solutions of problems of inverse trigonometric functions. Inverse trigonometric functions ,its domain and range	Students learned ab Solutions of problen inverse trigonometr functions. Inverse trigonometric functi ,its domain and ran

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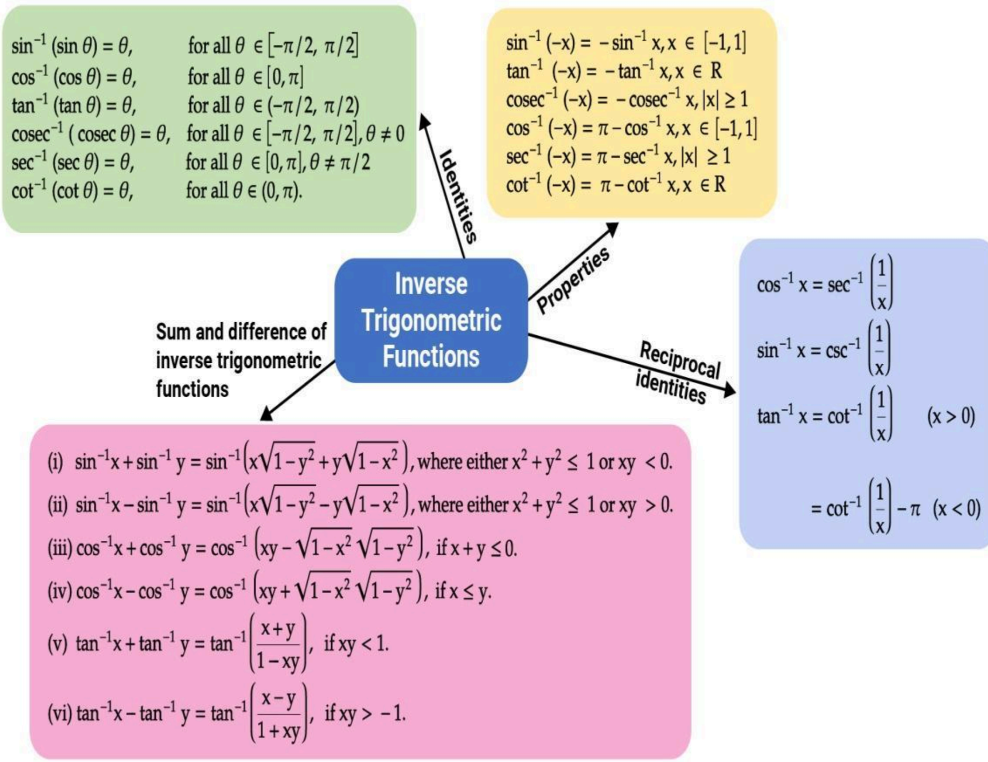
<tr><td></td><td>
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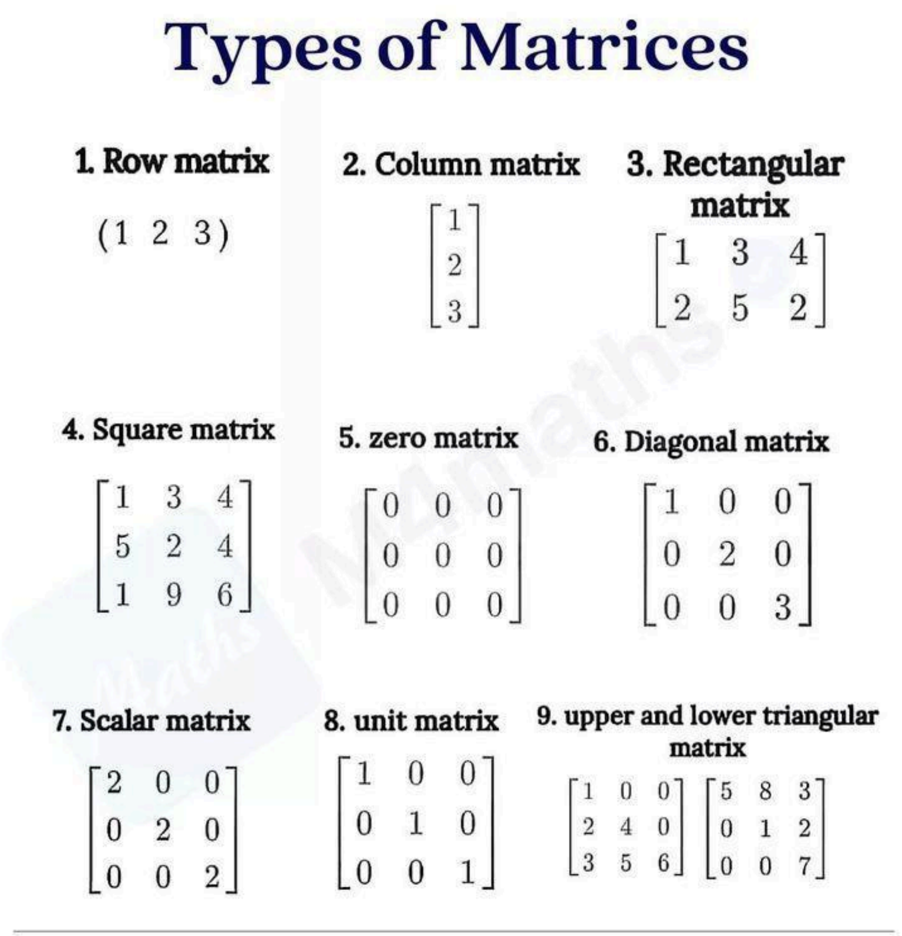
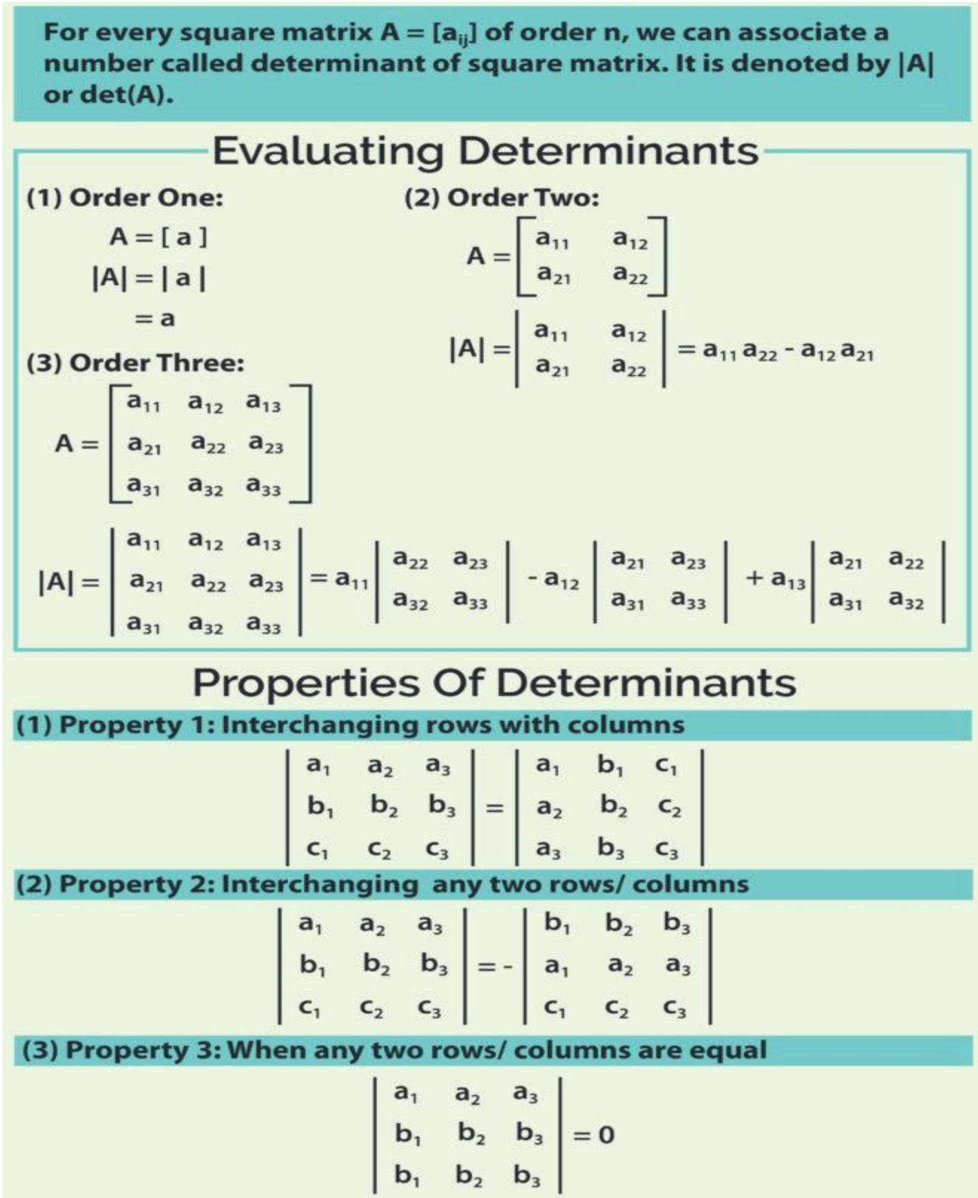
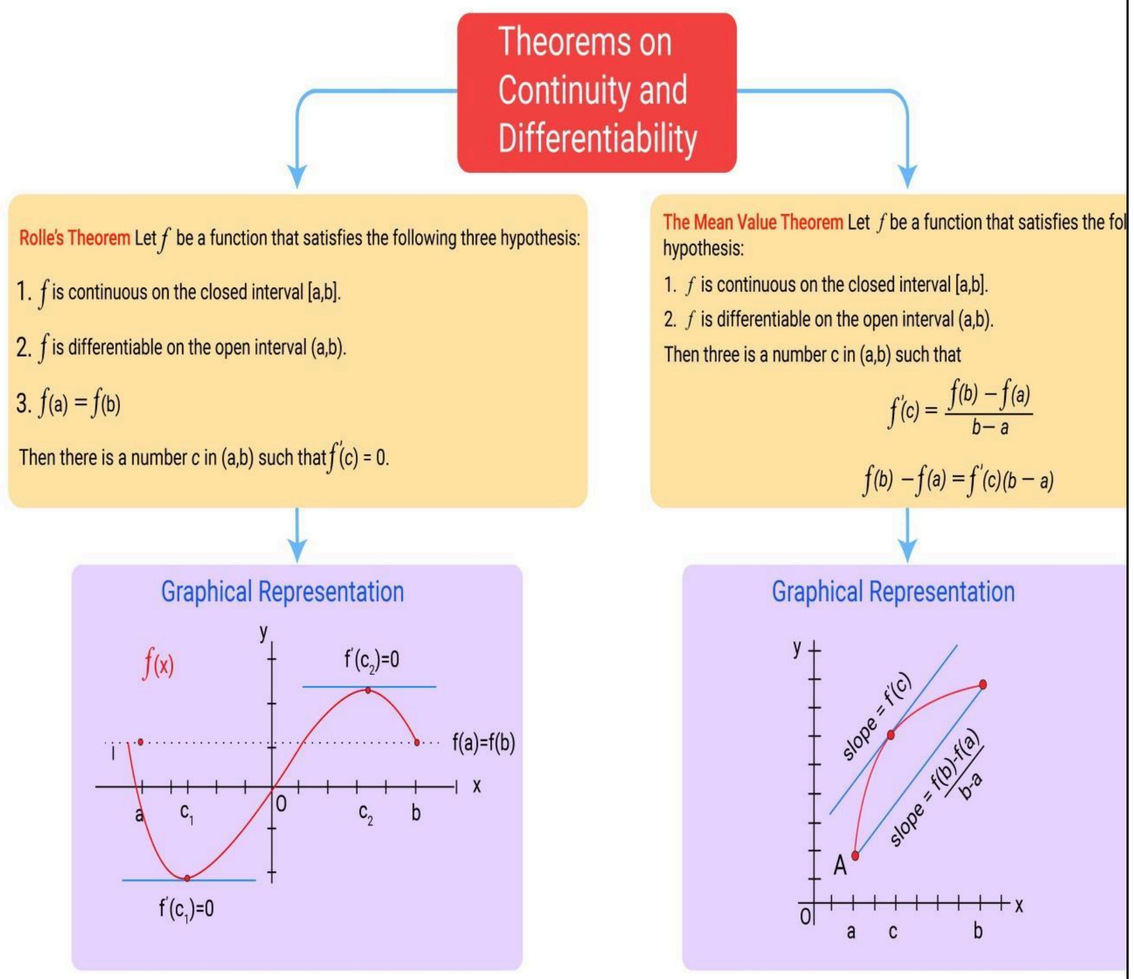
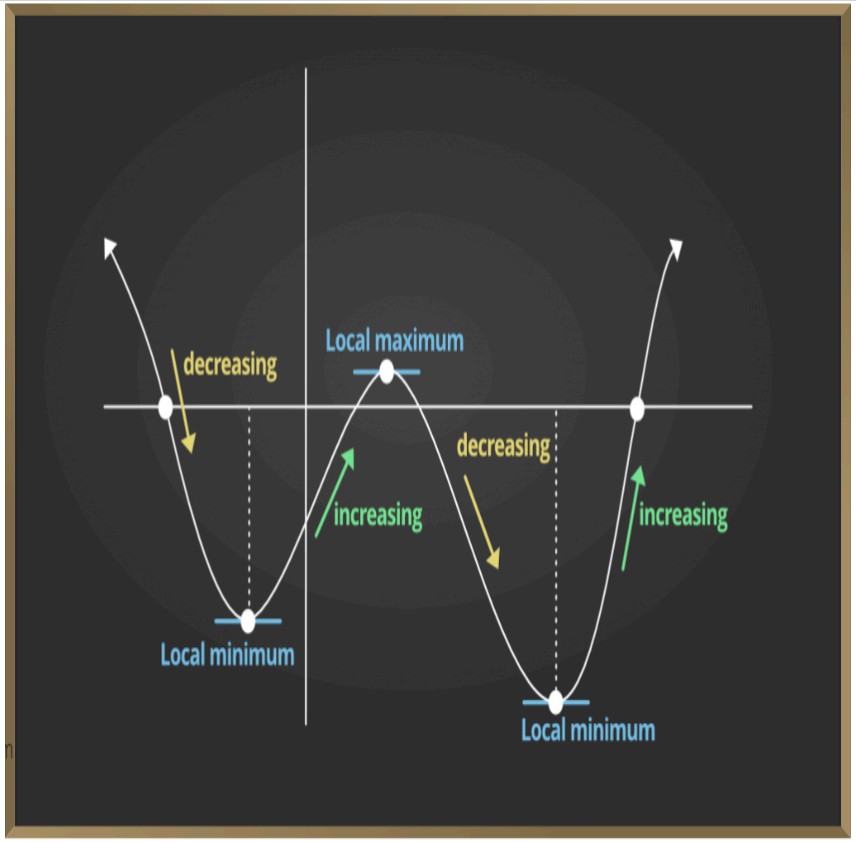
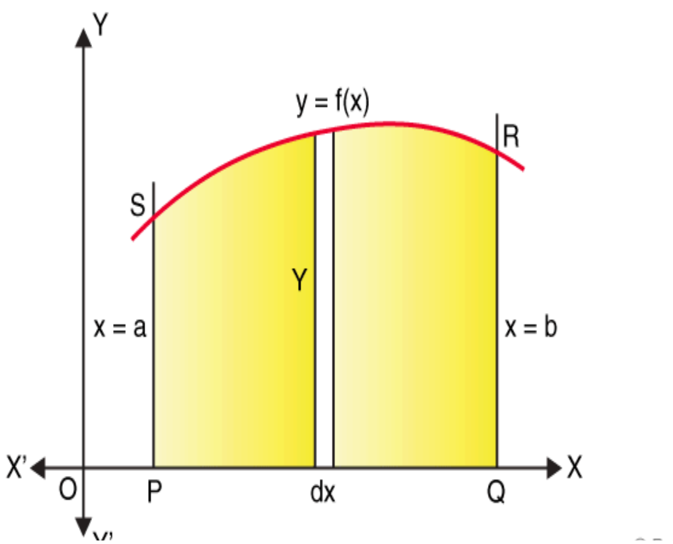
3	Matrices 	April–15 Days	Through problems based on Matrix and Determinants, they will develop 1)Imagination 2)Systematic approach 3)To handle real life situation	Students will be able to learn: Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operations on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Noncommutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2).	Students would be a to : Concept, notation, o equality, types of matrices, zero and identity matrix, tran of a matrix, symmet and skew symmetri matrices. Operation matrices: Addition a multiplication and multiplication with scalar. Simple prope of addition, multipli and scalar multiplic Noncommutativity o multiplication of ma and existence of nor matrices whose pro is the zero matrix (r to square matrices o order 2).

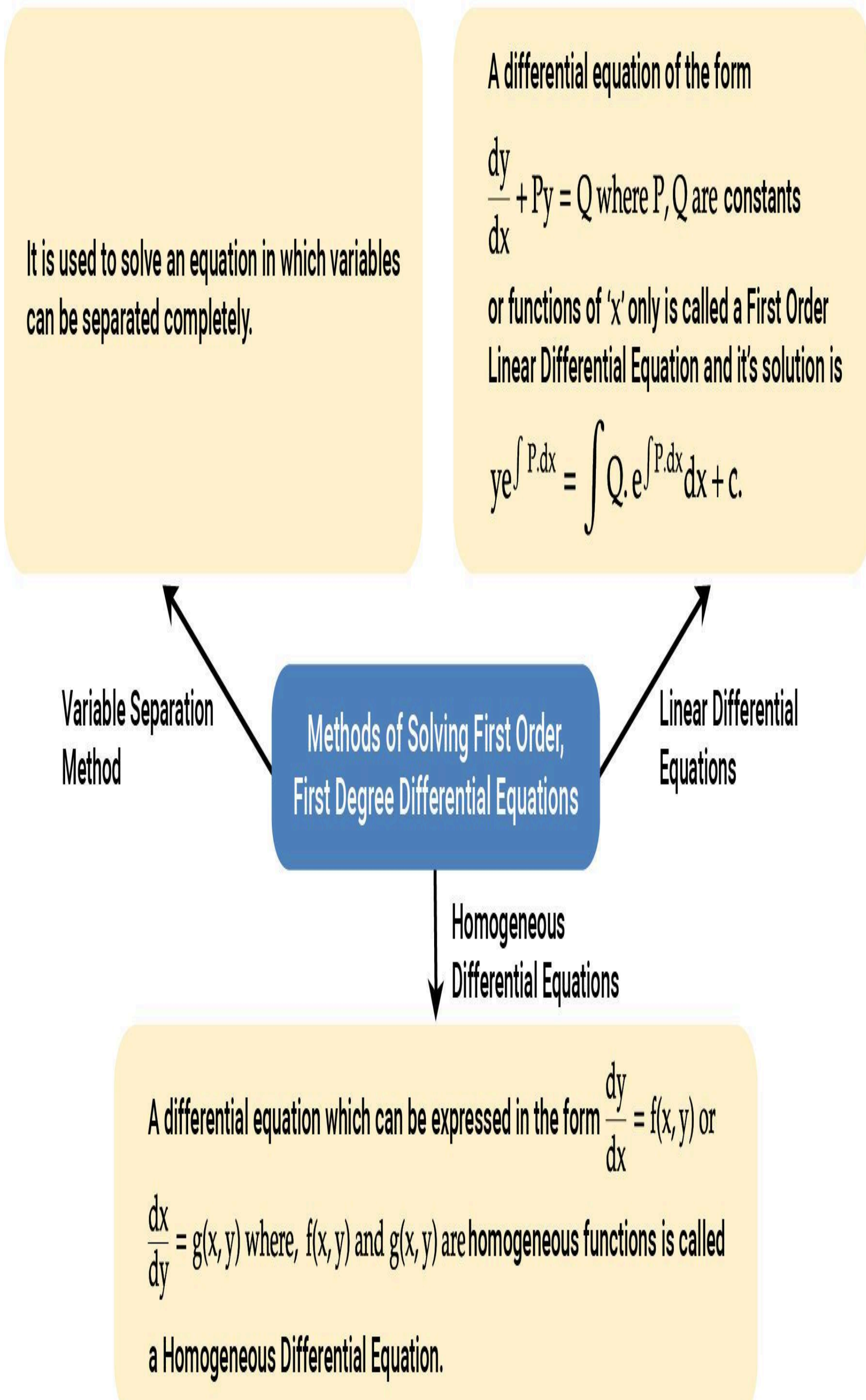
4	Determinants  For every square matrix $A = [a_{ij}]$ of order n, we can associate a number called determinant of square matrix. It is denoted by $\|A\|$ or det(A). **Evaluating Determinants** **(1) Order One:** $A = [a]$, $\|A\| = \|a\| = a$ **(2) Order Two:** $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$, $\|A\| = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} = a_{11}a_{22} - a_{12}a_{21}$ **(3) Order Three:** $A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ $\|A\| = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} = a_{11}\begin{vmatrix} a_{22} & a_{23} \\ a_{32} & a_{33} \end{vmatrix} - a_{12}\begin{vmatrix} a_{21} & a_{23} \\ a_{31} & a_{33} \end{vmatrix} + a_{13}\begin{vmatrix} a_{21} & a_{22} \\ a_{31} & a_{32} \end{vmatrix}$ **Properties Of Determinants** **(1) Property 1: Interchanging rows with columns** $\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix} = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$ **(2) Property 2: Interchanging any two rows/ columns** $\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix} = - \begin{vmatrix} b_1 & b_2 & b_3 \\ a_1 & a_2 & a_3 \\ c_1 & c_2 & c_3 \end{vmatrix}$ **(3) Property 3: When any two rows/ columns are equal** $\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ b_1 & b_2 & b_3 \end{vmatrix} = 0$	April 05 Days, May-05 Days	Through problems based on Matrix and Determinants, they will develop 1)Imagination 2)Systematic approach 3)To handle real life situatio	Students will able to describe Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.	Students would be a to learn: Determinant of a sq matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finc the area of a triangl Adjoint and inverse square matrix. Consistency, inconsistency and number of solutions system of linear equations by examp solving system of lin equations in two or variables (having ur solution) using inve a matrix.
5	Continuity and Differentiability	May-08Days,	To enable the students to	Students will be able to learn: Continuity and	Students would be a to learn:

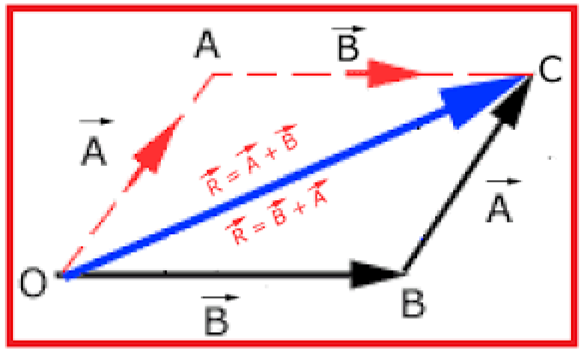
		June 10 Days	understand 1)Through problems based Rolles Theorem and Mean value Theorem imagination skills are imbibed. 2)Derivatives are used in economics to find out cost function and application skill will developed.	differentiability, chain rule, derivative of inverse trigonometric functions, x, x and x, 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.	Continuity and differentiability, cha rule, derivative of in trigonometric functi x, x and x, derivati implicit functions. Concept of exponen and logarithmic functions. Derivativ logarithmic and exponential function Logarithmic differentiation, deri of functions express parametric forms. S order derivatives.
6	Applications of Derivatives	June 08 Days	Through problems based on AOD, they will develop 1)Imagination 2)Systematic approach 3)To handle real life situation	Learners will be able to understand the Applications of derivatives: increasing/decreasing functions, tangents and normal, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate	Students would be a to Understand Applications of derivatives: increasing/decreasi functions, maxima a minima (first deriva test motivated geometrically and se derivative test given provable tool). Simp problems (that illus

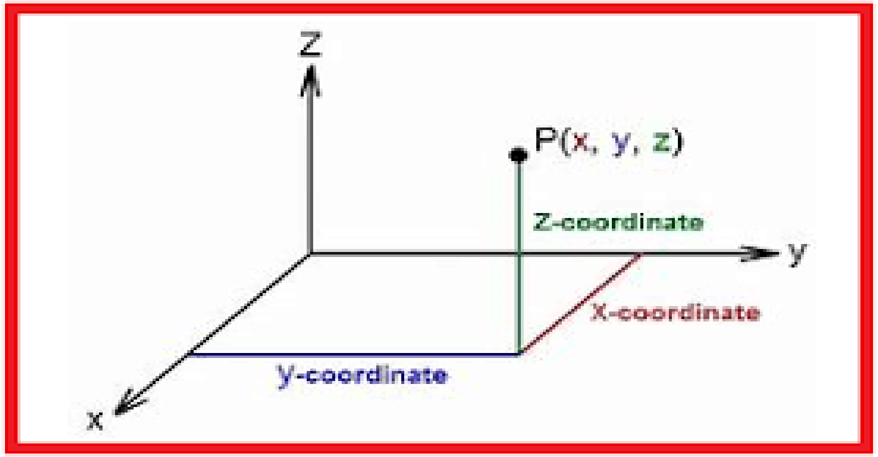
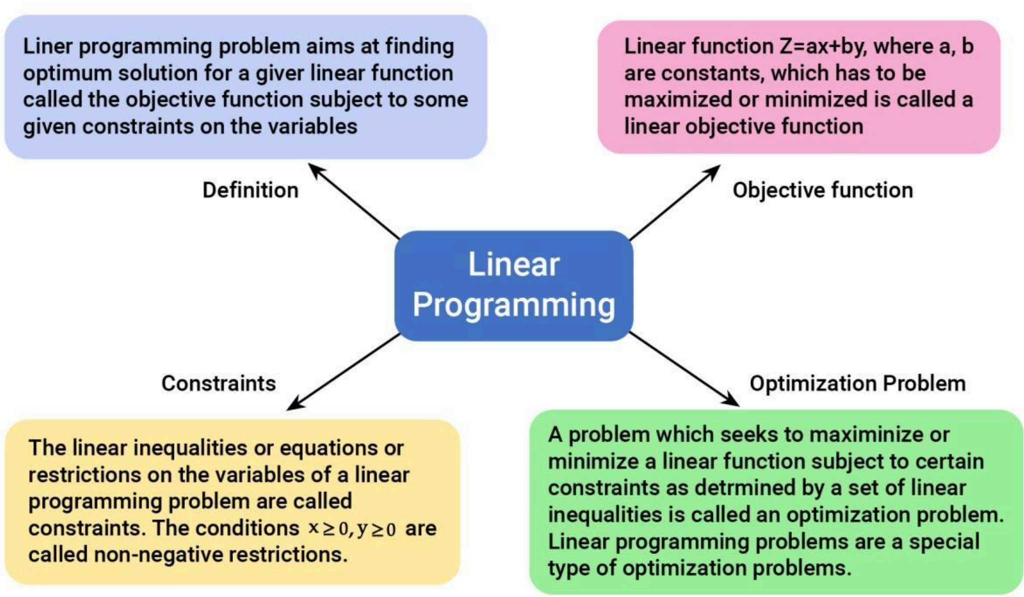
				basic principles and understanding of the subject as well as real life situations).	basic principles and understanding of th subject as well as re situations).
7	Integrals	July-15 Days	Through problems based on integration , they will develop 1)Manipulation (assumption) 2) Logical thinking 3) Systematic approach	Understand and appreciate the role of Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, properties of Definite integrals	Students would be a to:- Understand and appreciate the role o Integration as inver process of differenti Integration of a vari functions by substitution, by par fractions and by par properties of Definit integrals

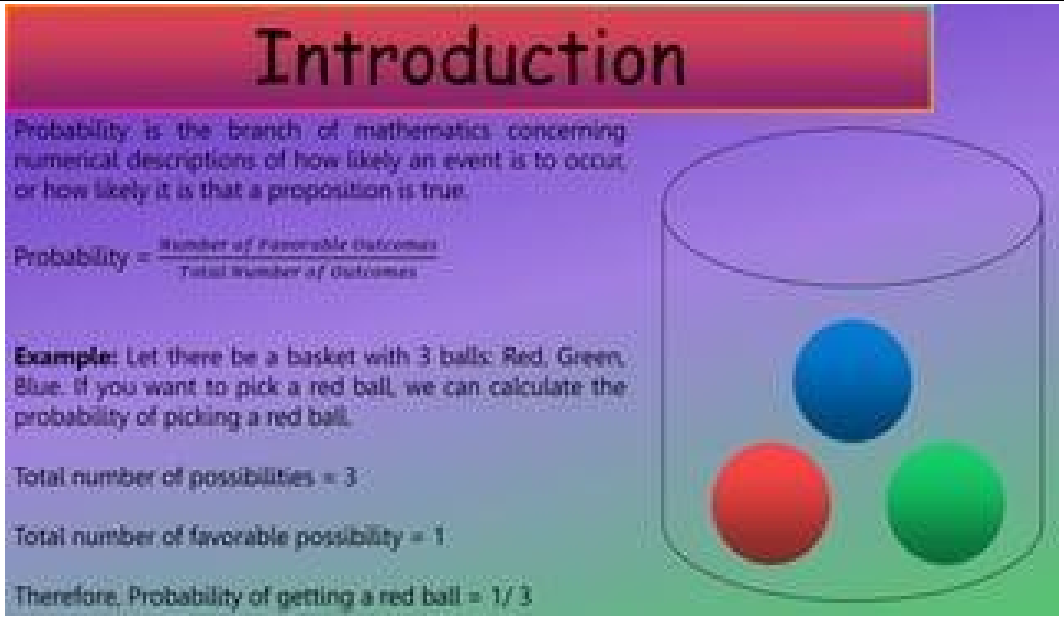
	(i) $\int \frac{dx}{x^2 - a^2} dx = \frac{1}{2a} \log \left\| \frac{x-a}{x+a} \right\| + C$ (ii) $\int \frac{1}{a^2 - x^2} dx = \frac{1}{2a} \log \left\| \frac{a+x}{a-x} \right\| + C$ (iii) $\int \frac{dx}{x^2 + a^2} dx = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$ (iv) $\int \frac{1}{\sqrt{a^2 - x^2}} dx = \sin^{-1} \frac{x}{a} + C$ (v) $\int \frac{1}{\sqrt{x^2 - a^2}} dx = \log \left\| x + \sqrt{x^2 - a^2} \right\| + C$ (vi) $\int \frac{1}{\sqrt{x^2 + a^2}} dx = \log \left(x + \sqrt{x^2 + a^2} \right) + C$				
8	Applications of the Integrals  	July-04 Days, August- 05 Days	To enable the students to develop 1)Critical thinking to visualize shapes 2) Accuracy for calculating area	Students will able to define Applications in finding the area under simple curves, especially lines, parabolas; area of circles /ellipses (in standard form only) (the region should be clearly identifiable).	Students would be a to define:- Applications in finc the area under simp curves, especially li parabolas; area of c /ellipses (in standar form only) (the regio should be clearly identifiable).

9	Differential Equations	August- 13 Days	To enable the students to understand 1)Different types solution 2)Different approaches for solution to problem	The students will be able to define Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order.	Students would be a to define: Definition, order an degree, general and particular solutions differential equation Solution of different equations by metho separation of variab solutions of homogeneous differ equations of first or


It is used to solve an equation in which variables can be separated completely.
A differential equation of the form
$\frac{dy}{dx} + Py = Q$ where P, Q are constants
or functions of 'x' only is called a First Order Linear Differential Equation and it's solution is
$ye^{\int P.dx} = \int Q.e^{\int P.dx}dx + c.$
Variable Separation Method
Methods of Solving First Order, First Degree Differential Equations
Linear Differential Equations
Homogeneous Differential Equations
A differential equation which can be expressed in the form $\frac{dy}{dx} = f(x, y)$ or
$\frac{dx}{dy} = g(x, y)$ where, $f(x, y)$ and $g(x, y)$ are homogeneous functions is called
a Homogeneous Differential Equation.

10	Vectors 	September-08 Days	Through the concept of vectors and its usage students will attain 1) Development of visualization 2)understanding need for different types of quantities	Students will be able to Understand the 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	Students would be a to Understand the Vectors and scalars magnitude and dire of a vector. Directio cosines and directio ratios of a vector. Ty of vectors (equal, ur zero, parallel and collinear vectors), position vector of a negative of a vector, components of a vec addition of vectors, multiplication of a v by a scalar, position vector of a point div a line segment in a ratio. Definition, Geometrical Interpretation, prop and application of s (dot) product of vect vector (cross) produ vectors
11	Three - dimensional Geometry	September-02 Days October-08 Days	Through approach adopted for problems students will attain 1)Imagination 2)Systematic approach 3)Efficiency 4)Creativity	Students will be able to Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines.	Students would be a to understand Direction cosines ar direction ratios of a joining two points. Cartesian equation vector equation of a skew lines, shortest distance between tw lines. Angle betweer lines.

					
12	Linear Programming 	October-10 Days	Through this chapter students will attain 1) To handle optimization problems(Efficiency) 2) develop Systematic approach 3)Differentiate constraint from problem.	Students will be able to Understand Introduction, related terminology such as constraints, objective function, optimization, 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).	Students would be a to Understand Introduction, relate terminology such as constraints, objectiv function, optimizati graphical method of solution for problem two variables, feasib and infeasible regio (bounded or unbour feasible and infeasil solutions, optimal feasible solutions (u three non-trivial constraints).
13	Probability	October-06 Days November-1 0 Days	Through this chapter students will develop 1)Logical thinking	Students will be able to understand Conditional probability, multiplication theorem on	Students would be a to understand Conditional probabi multiplication theor

			to Handling Risk 2)Imagination for Manipulating situation for better result.	probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean of random variable.	on probability, independent events probability, Bayes' theorem, Random variable and its probability distribu mean of random va