

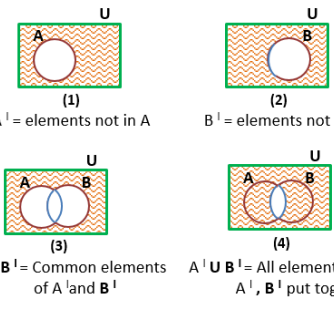
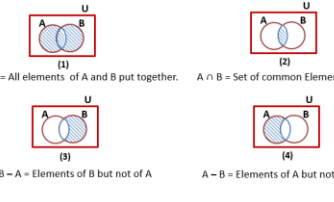
ANNUAL CURRICULAM PLAN

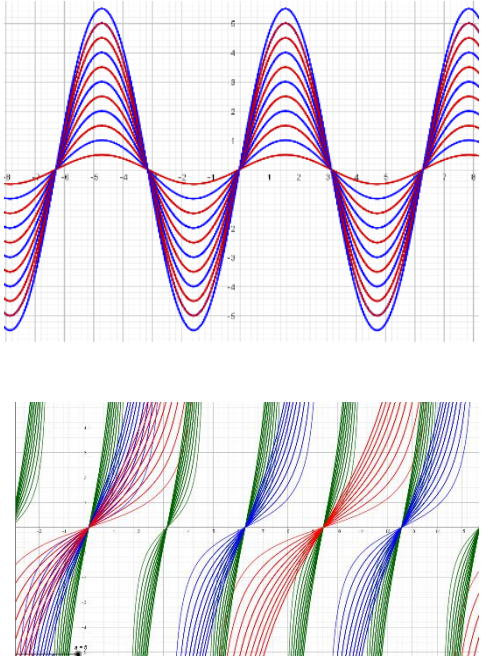
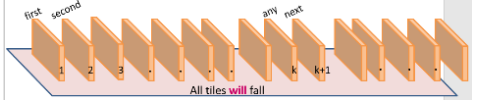
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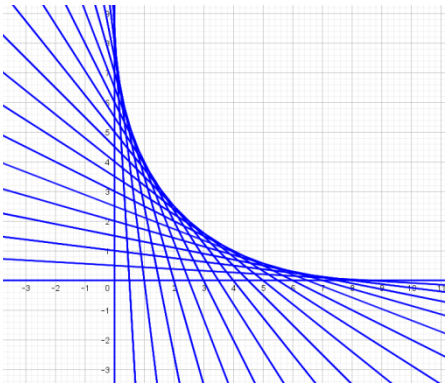
MATHEMATICS – Class 11.

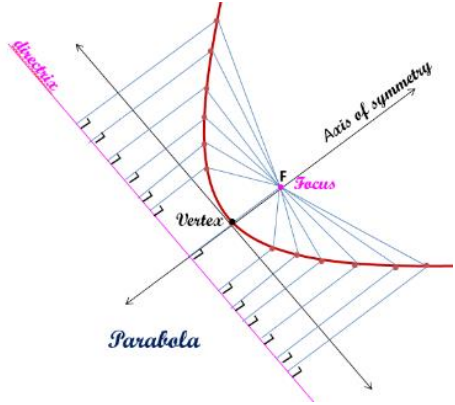
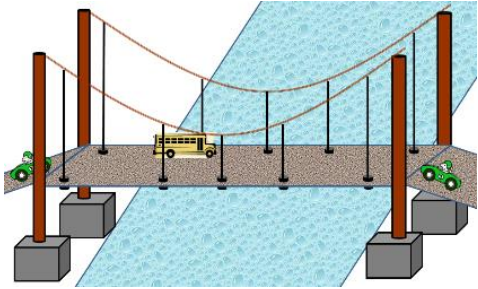
VISION :Mathematics is to be done with understanding of logic and concepts, and with dedication. It helps develop the skills to **observe a given situation, analyze various information, organize the procedure, choose the best ways, concentrate on minute issues, to be logical in approach, to be accurate in understanding authentic definitions, to be critical for further improvement, to be laborious** and much more.

PERIOD: April – September.

CHAPTER	TRANSACTION STRATEGY/ INNOVATIVE PEDAGOGICAL ACTIVITY	LEARNING OUTCOME	CORE SKILLS/ART INTEGRATION/ INTERDISCIPLINARY LINKAGE.
<p>1. SETS</p> <ul style="list-style-type: none"> --Roster form and set Builder form. --Union, intersection, And compliment of sets. -- Venn diagrams. -- Real life applications 	<p>An informal survey of various personal facts about the students, is done to introduce and to explain the meaning of ‘a well-defined group of objects’, which is the definition of a ‘SET’.</p> <p>Various terms and their notations, like, ‘belongs to’, ‘subset of’, empty set, union, intersection, compliment, universal set etc are discussed with appropriate real life examples.</p> <p>Logical proofs of properties of ‘SET ALGEBRA’ and their numerical verifications are done.</p> <p>Use of Venn Diagrams, to analyse a data, is practiced on variety of situations.</p>	<p>Students learn to write a set in Roster form and in set builder form.</p> <p>They are able to use the operations like Union, intersection, and compliment of sets.</p> <p>Their analytical skill based on logical reasoning is enhanced.</p> <p>They become familiar with the effective use of Venn diagrams to analyse a data obtained from the survey on Real life facts.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Art Integration:</p>  <p>A^c = elements not in A B^c = elements not in B</p> <p>$A \cap B$ = Common elements of A and B $A \cup B$ = All elements of A, B put together</p>  <p>$A \cup B$ = All elements of A and B put together. $A \cap B$ = Set of common Elements of A and B.</p> <p>$B - A$ = Elements of B but not of A $A - B$ = Elements of A but not of B</p> <p>Interdisciplinary Linkage: Computer Programming, Data Analysis.</p>
<p>3. TRIGONOMETRIC FUNCTIONS</p> <ul style="list-style-type: none"> --Sexagecimal and Circular measurements of angles --Trigonometric Functions of sum and multiple-angles --Trigonometric Identities --General and particular solutions of trigonometric equations 	<p>Degree and Radian measures of angles and their use in calculating the area of a sector and length of arc of a circle.</p> <p>Trigonometric ratios are then modified in to Trigonometric functions of Co-</p>	<p>Learner is capable of converting the measurements of angles between degree and Radian measures.</p> <p>They are able to use Trigonometric Identities involving sum and multiple angles, to prove more equations.</p>	<p>Core Skill: To be logical in approach, Toanalyse various information, to be logical in approach, to be accurate.</p> <p>Art Integration:</p>

	<p>terminal angles, Sum of angles, Multiple Angles. Trigonometric Proof of Identities and their applications are explained.</p> <p>General and Particular solutions of Trigonometric equations and their applications are taught.</p>	<p>Able to solve for General and particular solutions of trigonometric equations.</p>	 <p>Interdisciplinary Linkage: Oceanography, Graphing of Trajectory, Designing.</p>
<p>4. PRINCIPLE OF MATHEMATICAL INDUCTION</p> <p>--Logical application of The Principle of Mathematical Induction to prove the Validity of statements based on Natural Numbers.</p>	<p>The difference between ‘Sentences’ and ‘Statements’ are discussed.</p> <p>The ‘DOMINOGAME’ is discussed and played to observe the principle of its execution. The conditions which would enable ‘all’ Dominos to fall is observed and adapted to explain the principle of Induction.</p> <p>The Principle of Mathematical Induction, is used, to prove the validity of statements based on Natural Numbers.</p>	<p>Learner gets exposure to a variety of statements whose validity is to be established by the Logical application of the Principle of Mathematical Induction.</p> <p>Gets a very good opportunity to refine the skill of operating on algebraic expressions.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Art Integration:</p>  <p>Interdisciplinary Linkage: Computer Programming, Data Analysis.</p>
<p>5. COMPLEX NUMBERS AND QUADRATIC EQUATIONS.</p> <p>--Real and Imaginary Parts, Modulus, amplitude and conjugate of a Complex Number.</p> <p>--Square root of a Complex Number</p> <p>--Polar form</p> <p>Cartecian Form.</p>	<p>The Imaginary Number, i, is introduced as the square root of negative one.</p> <p>Complex Number is introduced in its standard form, specifying the real and imaginary parts.</p> <p>Algebra of complex</p>	<p>Learner gets to know about the new number system based on the imaginary number ‘i’.</p> <p>Able to observe and calculate the Real and Imaginary parts, Modulus, amplitude and conjugate of a Complex Number.</p> <p>Able to calculate the</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Computer Programming.</p>

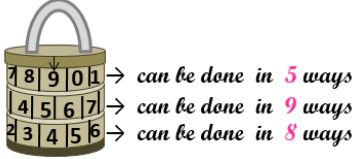

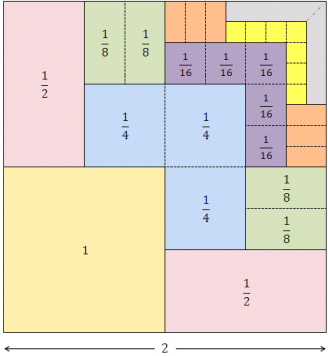
	<p>Numbers, Conjugate and Modulus are explained.</p> <p>Polar form and Argund Plane are introduced.</p>	<p>Square root of a Complex Number.</p> <p>Learn to Switch between Polar and Cartecian Form of complex numbers.</p>	
<p>6. LINEAR INEQUALITIES.</p> <p>--Solving Linear Inequations.</p> <p>-- Solving Real life Problems using Linear inequations.</p>	<p>Inequations are introduced with its meaning. Rules to be followed while solving inequations are taught. Practical applications using inequations are worked out for various problems.</p> <p>Graphical method to Solve system of inequations in two variables is done.</p>	<p>Student get exposure to the algebra involved in an inequation.</p> <p>Learn to solve system of linear inequations in one variable.</p> <p>Learn to solve system of linear inequations in two variables.</p>	<p>Core Skill: Analyse numerical information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Business Administration.</p>
<p>10. STRAIGHT LINES</p> <p>--Slope of a straight Line.</p> <p>--Condition of Perpendicularity and parallelism of straight lines.</p> <p>--Angle between lines.</p> <p>--Six methods of finding The equation of straight lines, based on the kind of information given.</p> <p>--Extracting the values of various features like, slope, intercepts, perpendicular distance from the origin etc, of the straight line, from its equation.</p> <p>--Practical Applications.</p>	<p>The direction of a line is measured as its slope. Slope is found in terms of its inclination as well as using the coordinates of two points on the line. Conditions of perpendicularity, parallelism, and the angle between two lines are expressed in terms of the slopes of the two lines.</p> <p>Equation of a line is found as a unique algebraic equation, satisfied by the coordinates of each and every point of the line. Different ways of getting the equation of a straight line is discussed, based on the given information like, slope, intercepts on the axes, points through which it passes, the perpendicular distance from the origin etc.</p> <p>From the standard equations of straight lines, all the above specifications of the line are calculated to use for further</p>	<p>Students learn about Slope of a straight line and, understand the Condition of their Perpendicularity and parallelism, and the Angle between them.</p> <p>Six methods of finding the equation of straight lines, based on the kind of given information, train them to be investigative, to asses and analyse a bulk of data. It help them develop systematic practices to reach a goal.</p> <p>Extracting the values of various features like, slope, intercepts, perpendicular distance from the origin etc, of the straight line, from its equation, lead to further solving of the problem.</p> <p>They get trained to use these equations to predict the values of varying quantities seen in real life.</p>	<p>Core Skill: To be investigative. To observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Art Integration:</p>  <p>Interdisciplinary Linkage: Graphing of Trajectory, Architecture.</p>

	<p>solving indirect problems on multiple straight lines.</p> <p>Different varying quantities seen in the real life, which are linearly related are expressed as an algebraic equation, and used to analyse and to predict their values.</p>		
<p>11. CONIC SECTIONS</p> <p>--Equations of Circle, Ellipse, Parabola and Hyperbola.</p> <p>--Centre, radius, focus, directrix, Vertex, latus rectum, eccentricity etc. of these conic sections.</p> <p>--Real life applications.</p>	<p>Intersection of a cone with a plane in different angles are introduced as the conic sections.</p> <p>Circle is defined as a locus based on a fixed point and a fixed constant, and its equation is found using them. Equations are also formed, using indirect information.</p> <p>Parabola, Ellipse and hyperbola also are introduced based on their respective locus definitions. Foci, eccentricity, directrix, latus rectum, Major and minor axes etc are discussed in the class.</p> <p>Practical Application of these equations in real life, also are explored.</p>	<p>-Equations of Circle, Ellipse, Parabola and Hyperbola.</p> <p>-Centre, radius, focus, directrix, Vertex, latus rectum, eccentricity etc. of these conic sections.</p> <p>-Real life applications.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Art Integration:</p>   <p>Interdisciplinary Linkage: Architecture, Graphing of Trajectory.</p>
<p>12. THREE DIMENSIONAL GEOMETRY</p> <p>--Introduction to the third dimension of geometry.</p> <p>--Distance Formula</p> <p>--Section Formula</p> <p>--Applications in plane geometry.</p>	<p>The third dimension of analytical geometry is introduced to the class. Eight Octants and the three planes which separate them are visualised using the walls and floor of the class room.</p> <p>Distance formula and Section formula are extended for the third dimension, and are use for finding different</p>	<p>Students get introduced to the third dimension of geometry. They learn to use distance Formula and Section Formula for various calculations.</p> <p>They also learn its Applications in plane geometry.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Architecture.</p>

<p>15. STATISTICS</p> <p>-Measures of dispersion of row data, grouped data, and continuous data.</p> <p>-Mean Deviation from Mean</p> <p>-Mean Deviation from Median</p> <p>-Variance</p> <p>-Standard deviation.</p> <p>-Short-cut method for variance.</p> <p>-Coefficient of Variation.</p> <p>-Rectifying the error of calculation in Mean and Variance.</p> <p>-Real life applications.</p>	<p>measures.</p> <p>A revision in the form of a discussion, about different measures of a data is done to asses and improve them.</p> <p>The need of measuring the dispersion is discussed by taking examples of real life observation.</p> <p>The different types of Data like, row data, grouped data, and continuous data are taken for measuring the dispersion.</p> <p>To overcome the effect of the scale of different data, a better measure, called coefficient of variation, also taught to compare the scattering of different data.</p> <p>Problems on correcting the error occurred on calculation of mean and variance using incorrect observation, also done.</p>	<p>Student get to know about different Measures of dispersion of row data, grouped data, and continuous data such as Mean Deviation from Mean, Mean Deviation from Median, Variance and Standard deviation.</p> <p>They also learn Short-cut method for variance and Coefficient of Variation.</p> <p>Rectifying the error of calculation in Mean and Variance is another attraction of the chapter.</p> <p>Real life applications to compare different data is useful.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Data Analysis, Business Administration.</p>
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PERIOD: October – March.

CHAPTER	TRANSACTION STRATEGY/ INNOVATIVE PEDAGOGICAL ACTIVITY	LEARNING OUTCOME	CORE SKILLS/ART INTEGRATION/ INTERDISCIPLINARY LINKAGE.
<p>2. RELATIONS AND FUNCTIONS</p> <p>--Cartecian Product</p> <p>--‘Relation’ from a set to another set.</p> <p>--Domain, Range and codomain.</p> <p>--Functions</p>	<p>Subsets of the Cartecian Product of two sets, are observed, based on various conditions, set up between the elements of the two sets, and each subset is defined as a Relation from one set to the other.</p> <p>Domain, Codomain and Range of Relations, are discussed, and observed them on examples.</p> <p>Introduce Functions as Relations satisfying two specific conditions. Graphs of many functions including Signum, Greatest Integer, Trigonometric, Reciprocal</p>	<p>Learner is introduced to the all-new level of Modern Mathematics, through the terms, Cartecian Product, Relations from a set to another set, Domain, Range and codomain of relations and Functions.</p> <p>Graphs of Real Functions, give the learner, a visual feel of the functions, which enable him/her to distinguish different types of functions.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Art Integration:</p> <div data-bbox="1018 1749 1485 2192" data-label="Diagram"> </div>

	Functions.		Interdisciplinary Linkage: Computer Programming, Data Analysis.
7. PERMUTATIONS AND COMBINATIONS. --Factorial notation. --Multiplication and Addition Theorems of counting. --permutations --Combinations --Real life applications.	Factorial Notation and its usage in calculations is introduced. Multiplication Principle of counting, Permutations and Combinations for counting is explained, and real life applications are discussed to apply them.	Students learn the counting technique using Permutations and Combinations which is useful in various real life applications. The skills of understanding complex verbal descriptions, and analysing them, is refined, while doing real life problems.	Core Skill: To be logical in approach, To analyse various information, to be accurate. Art Integration: 
8. BINOMIAL THEOREM -Expansion of integral indices of Binomial Expressions. --General term, Middle term, coefficient of indicated terms.	Binomial Theorem is introduced using Pascal's Triangle and then proved using the Principle of mathematical Induction. Middle term, general term, coefficient of indicated power of the variable etc are explained.	Student get general pattern to expand integral powers of a Binomial Expressions using Binomial expansions. Skill to handle the exponents and like terms are developed.	Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions. Art Integration: 
9. SEQUENCES AND SERIES --Arithmetic and Geometric Progressions, --Applications of general terms and sum of various special series. --Infinite sum of geometric series.	Numbers are analysed to observe the hidden patterns. According to the type of pattern, different sequences are named. General term, based on the position of the term are derived, and used for finding any desired term. Sum of a specified number of terms is calculated with the help of formula.	Students develop ability to observe and analyse the nature of numbers given to them and get trained to generalise a pattern in terms of their position in the ordered collection. They sharpen the skill of calculating the desired term or sum of a given sequences.	Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions. Interdisciplinary Linkage: Computer Programming, Numerical Analysis.
13. LIMITS AND DERIVATIVES --Left limit and right limit --Derivatives. --Evaluating the limit of a function at a point. --Product rule, Quotient rule and chain Rule to differentiate real functions.	The constant to which a variable is approaching, based on its independent variable, is termed as 'the limit'. Derivative at appoint, of a function is introduced as the limit of the ratio of change in the two variables involved. Product rule and Quotient rule are explained to find the derivatives of functions involving product and quotient.	Student get an idea about the Left limit and right limit of a function at a given point. They are also able to Differentiate real functions from the definition of derivatives. Further, they are expected to differentiate functions using Product and quotient rules.	Core Skill: Analyse numerical information, to be logical in approach, to be accurate in understanding authentic definitions. Art  Integration:

			Interdisciplinary Linkage: Architecture.
<p>14. MATHEMATICAL REASONING</p> <ul style="list-style-type: none"> -Statements and sentences. -Negation of a statement. -Compound statements -Connectives like, 'And' , 'Or'. -Qualifiers like, 'There exists', 'For all'. Implications of statements -Contrapositive and Converse of a statement. -Validating statements. 	<p>Language of Mathematics is Dealt in this section of Mathematics. First of all, Statements are distinguished from sentences.</p> <p>Negation of statement and composition of two or more statements are explained.</p> <p>Technical analysis of the statements to ascertain their validity is done in a scientific way.</p> <p>Converse and contra-positive of statements are also explained.</p>	<p>Student acquire better understanding of the language of Mathematics to express as well as to understand the interrelated facts.</p> <p>They get equipped to make conclusions on more complex collection of information, using the scientific understanding of the Language used.</p> <p>Contrapositive and Converse of a statement, and the steps of Validating statements are the specifications of this chapter..</p>	<p>Core Skill: To be investigative. To observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Logical Analysis.</p>
<p>16. PROBABILITY</p> <ul style="list-style-type: none"> -Simple Space. -Events -Mutually Exclusive Events -Exhaustive Events. -Probability of combined events. -Use of Permutations and Combinations in calculating Probability. 	<p>Student learn the scientific way of measuring the chance of occurring events.</p> <p>Different terms like, Sample Space, Events, Mutually exclusive and Exhaustive Events are introduced in the class.</p>	<p>Student is expected to measure the chance of occurring, by following the well-defined procedure. They are expected to understand and use the terms like Simple Space, Events, Mutually Exclusive Events, Exhaustive Events.</p> <p>Probability of combined events are found with the help of set theory.</p> <p>They also Use of Permutations and Combinations in calculating Probability.</p>	<p>Core Skill: Observe and analyse various information, to be logical in approach, to be accurate in understanding authentic definitions.</p> <p>Interdisciplinary Linkage: Business Administration.</p>