INFANT JESUS CONVENT SCHOOL
ANNUAL PLAN- MATHEMATICS-CLASS: X(2023-24)

MONTH / NO OF DAYS	TOPIC: SUB TOPIC	OBJECTIVES	AIDS/ ACTIVITIES	MULTIPLE INTELLIGENCE SKILLS	LEARNING OUTCOME
Extra Classes– **No of Days 10**	Volume & Surface Areas of combinations of solid figures *Surface area and volume of cube, cuboid, cylinder, Cone, sphere and hemisphere • Volume and surface area of combination of figures • Conversion of a solid to another type.	The student will be able to *Identify difference between surface area and volume. *Apply surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. *develop problems solving skills involving converting one type of metallic solid into another and other mixed problems. *Application of surface areas and volume in daily life	**KNOWLEDGE:** • To identify solid figures • Apply formula of 3d solids figures **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *****Tabular form to learn formula with solid figures *Draw different soild shapes. *To verify the ratio to find volume of cone and cylinder **UNDERSTANDING:** *SURFACE AREA AND VOLUME OF COMBINATIONS *Cone on a Cylinder. *Cone on a Hemisphere: *Conical Cavity in a Cylinder *Cones on Either Side of Cylinder**.**	• **Computation skill** • **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	The Students would be able to * Identify difference between surface area and volume. *Apply surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. * To identify appropriate formula and to apply them to find out surface area and volume of combination of solids.

APRIL – No of days 15	Probability — A Theoretical Approach	Students will be able to: • Differentiate between Empirical probability and theoretical probability in order to find the two for a variety of cases • Calculate the probability of given events in an experiment in order to comment whether they are complementary events/Sure event/impossible event • Classical definition of probability. • Simple problems on finding the probability of an event.	**KNOWLEDGE:** • Coin tossing activity (two/ three coins together) • Activity based on sum of probability is one. **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *to understand means possibility * branch of mathematics that deals with the occurrence of a random event. * The value is expressed from zero to one. * Probability has been introduced in Maths to predict how likely events are to happen. **UNDERSTANDING:** • A probability is a number that reflects the chance or likelihood that a particular event will occur. • Probabilities can be expressed as proportions that range from 0 to 1, and they can also be expressed as percentages ranging from 0% to 100%.	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** • **Intrapersonal Intelligence**	Students would be able * To recall the concept experimental probability and to correlate with theoretical probability. * To understand the concept by doing hands on activity

	REAL NUMBERS • Fundamental Theorem of Arithmetic Proofs of irrationality of $\sqrt{3}$, $\sqrt{2}$ And $\sqrt{5}$	Students will be able to: • Know different number System and to apply HCF and LCM in different situations • Use the Fundamental Theorem of Arithmetic in order to calculate HCF and LCM of the given numbers in the context of the given problem • Irrational Numbers Recall the properties of irrational number in order to prove that whether the sum/difference/product/quotient of 2 numbers is irrational or not • Apply theorems of irrational number in order to prove whether a given number is irrational or not	**KNOWLEDGE:** • Quiz on HCF and LCM of numbers • feel the flow of reason while proving a result **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** • Use of real numbers in real life along with relevant examples and with the help of pictures • Represent math problems of HCF and LCM in pictorial form • Conduct basic mathematical operations using manipulatives and apply proofs **UNDERSTANDING:** • Meaning of Fundamental Theorems of Arithmetic • Difference between Prime and composite numbers • Difference between irrational numbers and rational numbers • Concept of HCF and LCM in real life • Difference between HCF and LCM	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence Intrapersonal Intelligence**	Students would be able to • Generalises properties of numbers and relations among them • apply HCF and LCM in different situations • Apply proofs of irrationality • apply them to solve problems related to real life contexts
MAY No of Days: 12	**Polynomials** • Geometric representation of polynomials	The students will able to * *understand Zeros of a polynomial.	**KNOWLEDGE:** • Zeroes of Polynomials using the intersections on x-axis. • With the help of polynomial equations, one can calculate the grocery bill for small and	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence**	Students would be able to * Recall the concept of polynomials.

	•Relation between zeroes and coefficients of a polynomial * Forming quadratic polynomial when the zeros are given	** Relationship between zeros and coefficients of quadratic polynomials.	even distance travelled by light in space. **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *Polynomials can be used to model different types of situations, like in the stock market to see how prices will vary with time. * In physics also polynomials are used to describe the trajectory of projectiles. * Polynomials used in industries and construction field also. * Polynomials are useful for every person and in every field **UNDERSTANDING:** *State with basic knowledge of Polynomial *Focus on the relationship between zeros and coefficient of variables. *Revise the chapter to build Structural *Approach towards Learning.	• **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** * **Intrapersonal Intelligence**	* Compare the relation between zeroes and coefficients of a polynomial * Comprehend the method to form a polynomial.
REVISION PT 1					
CONDUCTION OF PT-1 ASSESSMENT (Third WEEK OF MAY)					
REMEDIAL CLASSES					
JULY – No. of days 23	Pair of linear Equations in two Variables • Solving a pair of linear equations algebraically by substitution and elimination method. • Solution by	The Learner will be able to • finds solutions of pairs of linear equations in two variables using graphical and different algebraic methods (substitution, elimination)	**KNOWLEDGE:** *What is Linear Equation? * Identify the unknowns in the problem and assign variables **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** • To verify the conditions for consistency of a system of	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal**	The Students would be able to – * Recall the concept Linear equation and its solution. *Compare the consistency for different equations.

	graphical method. • Word problems on linear equations • Conditions for consistency of a system of linear equations	• solving linear equations applicable in daily life	linear equations in two variables by graphical representation • Frame an equation with the help of the algebraic expression and the data provided in the problem statement and solve it using systematic techniques of equation solving. • Retrace your solution to the problem statement and analyze if it suits the criterion of the problem **UNDERSTANDING:** *****Meaning of equation *to solve variables	• **Intelligence Intrapersonal Intelligence**	* To develop the skill of drawing graphs.
	Quadratic Equation *Standard form of a quadratic equation ax2 + bx + c = 0, (a ≠ 0). *Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. *Relationship between discriminant and nature of roots. *Situational problems based on quadratic equations related to day to day	The Learner will be able to * to identify a difference between quadratic equation and quadratic polynomial *apply creative skill to use of different methods like factorization, quadratic formula *Demonstrates strategies of finding roots and *determining the nature of roots of a quadratic equation. *solve real life examples (age questions, marbles sharing questions and so on)	**KNOWLEDGE:** ***** Standard form of a quadratic equation ***** Solutions of quadratic equations * Relationship between discriminant and nature of roots. **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *Make an ppt or collage to show the concept of quadratic in everyday life *Many physical and mathematical problems are in the form of quadratic equations **UNDERSTANDING:** *****A quadratic polynomial of the form $ax^2 + bx + c$, where $a \neq 0$ *Any value is a solution of a quadratic equation if and only if it satisfies the quadratic equation. *If $D = 0 \Rightarrow$ The roots are Real and Equal. If $D > 0 \Rightarrow$ The two roots are Real and Unequal. If $D < 0 \Rightarrow$ No Real roots exist.	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	Students would be able to – * Recall the concept of Quadratic Polynomial and correlate with linear equation and Quadratic equation. * determining the nature of roots of a quadratic equation. *Explore different methods to solve Quadratic equation and apply it in different situations.

	activities to be incorporated				
AUGUST – No. of Days -23	**ARITHMETIC PROGRESSIONS** * Motivation for studying Arithmetic Progression *Derivation of the nth term and sum of the first n terms of A.P. * Their application in solving daily life problems.	The student will be able to • predict the concept of sequence/patterns • Generate any formula. • Identify difference between common difference and first term • find the sum of nth term using formula • Develop skills to identify difference between nth term and sum of nth term	**KNOWLEDGE:** *Sequences, Series and Progressions *An arithmetic progression (AP) is a progression in which the difference between two consecutive terms is constant. *Finite and Infinite AP *Finding nth term *sum of nth term **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *Draw wall hanging or any design using patterns *To verify graphically that sum of first n natural numbers is n(n+1)/2 *To verify the sequence of an A.P **UNDERSTANDING:** *AP used in straight line depreciation. *AP used in prediction of any sequence like when someone is waiting for a cab. *Assuming that the traffic is moving at a constant speed he/she can predict when the next cab will come. *AP used in Pyramid-like patterns, where objects are changing in a constant manner	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	The Students would be able to – * Identify the series A.P * select appropriate formula to find out an and Sn of the A.P. *To identify the formula to find out an and Sn of the A.P. * to correlate the subject with art
	Triangle *Definitions, examples, counter examples of similar triangles. * Basic Proportionality Theorem/ Thales Theorem	The students will be able to *Definitions, examples of similar triangles. * If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. * If a line divides two sides	**KNOWLEDGE:** *Two figures having the same shape but not necessary the same size are called similar figures *Any two triangles are similar, if their ** Corresponding angles are equal **Corresponding sides are proportional *THALES THEOREM OR BASIC PROPORTIONALITY THEORY **SKILLS:**	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal**	The Students would be able to *Recall different types of triangle and their properties. *Explore different

	* Converse of BPT * Similarity Criteria **AAA/ AA **SSS **SAS	of a triangle in the same ratio, the line is parallel to the third side * If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar. * If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar. *If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar	• Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *Integrate all theorems in creative way with Art, music/rap * To verify the basic proportionality theorem by using parallel lines board, triangle cut outs **UNDERSTANDING:** **difference between similar and congruent triangles *able to identify similar triangles *apply similarity criteria *apply Thales's Theorem	**Intelligence Intrapersonal Intelligence**	methods to prove the theorems. *To apply the concept in different situation. *To verify the concept by learning by doing. * To correlate the subject with Art.
September no. of days - 05	**REVISION OF PT2/ TERM 1** **CONDUCTION OF PT 2 /TERM1 ASSESSMENT (Second Week of September)**				
October No of days – 22	**STATISTICS** • Mean, Median, Mode of grouped data. • Mean by Direct method and by Assumed mean method	The students will be able to * Apply direct method in order to calculate the mean of the grouped data * Apply assumed mean method in order to calculate the mean for a grouped data * Compute the mean and mode of the given data in order to interpret the two measures of central tendency * Apply formula for the median of a given grouped data in order to calculate missing values of Frequency * Differentiate between mean, median and mode with examples in order to understand most effective measure of central tendency in various cases	**KNOWLEDGE:** *Finding mean using direct, Assumed Mean and Step Deviation Method *Finding Mode and Median * Finding mean , Median and Mode using empirical formula **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** * *Statistics* teaches us the science of analysing and interpreting data. * The concept of statistics determines census data calculation for governmental needs as well as information about varieties of activities. **UNDERSTANDING:**	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	The Learner will be able to *Collect data, the necessity of the data, organization and representation of the data. *Acquire the knowledge of reading and interoperating central tendency i.e. mean , median and mode *Apply formula for mean, median and mode. calculates mean, median and mode for different sets of

			*difference between group and ungroup data * identify three methods of Mean * able to compute mode and median with the help of formula		data related with real life contexts.
	COORDINATE GEOMETRY *Concepts of coordinate geometry, *graphs of linear equations. *Distance formula. *Section formula (internal division).	The Learner will be able to *derives formulae to establish relations for geometrical shapes in the context of a coordinate plane, such as, finding the distance between two given points, to determine the coordinates of a point between any two given points, to find the area of a triangle, etc *To locate and read points on coordinate plane *Apply critically the concept of distance formula *Problem solving skill on section formula in day to day life situations	**KNOWLEDGE:** * The distance between two points that are on the same axis (x-axis or y-axis), * point P(x, y) divides the line segment joining A(x_1, y_1) and B(x_2, y_2) internally in the ratio m:n, then, the coordinates of P are given by the section formula * o find the ratio in which a given point P(x, y) divides the line segment joining A(x_1, y_1) and B(x_2, y_2),Assume that the ratio is k : 1 **SKILLS:** Analytical thinking Problem solving Critical thinking **APPLICATION:** *Points are to be plotted in Cartesian Plane on a graph paper and find out the distance between them. *Air traffic is managed and regulated by using coordinate geometry. *Coordinates of the flight are used to describe its current location of the aircraft. Even if an aircraft moves a small distance (up, down, forward or backward), the coordinates of flight are updated in the system for every slight change in its position. **UNDERSTANDING:** *find distance using distance formula * The **midpoint** of any line segment divides it in the ratio **1 : 1**. * To find the points of trisection P and Q which divides the line segment joining A(x_1, y_1) and B(x_2, y_2) into three equal parts:	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	Students would be able to * select appropriate formula to find out length of a line segment. * apply distance formula in different situation * apply section formula in different situation * compute midpoint using midpoint formula

	Introduction to Trigonometry **Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); *Values of the trigonometric ratios of 30^0 , 45^0 and 60^0 . *Relationships between the ratios. * Proof and applications of the identity $\sin^2A + \cos^2A = 1$.	The Learner will be able to *Identifies the application of trigonometric ratios *Learn trigonometric table *Apply trigonometric angles to find different solutions *Develop the skill to apply trigonometric identities.	**KNOWLEDGE:** * apply Trigonometric ratios * find Values of the trigonometric ratios * Proof and applications of the identity $\sin^2A + \cos^2A = 1$. **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** Making different Grids and to write the values of trigonometric ratios of specific angles. *To find trignometric table using palm method *To learn trignomteric ratio with " Pandit Badri Parsad Har Har Bhole" **UNDERSTANDING:** * able to identify trigonometry ratios and values * compute the Proof and applications of the identity $\sin^2A + \cos^2A = 1$	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence Intrapersonal Intelligence**	Students would be able to – *To prove Trigonometric identities * Compare, explore and estimate trigonometric ratios & values of specific angles *Develop mathematical skill determines all trigonometric ratios with respect to a given acute angle (of a right triangle) and uses them in solving problems in daily life contexts like finding heights of different structures or distance from them
	Application of Trigonometry *Heights and Distances	The Learner will be able to *Able to draw imaginary lines in form of height , base and perpendicular *Determine the use of trigonometry in finding the height & distance *Application of trigonometry ratio in daily	**KNOWLEDGE:** * apply difference between angle of elevation and angle depression * to find Heights and Distances using trigonometry ratio **SKILLS:** • Analytical thinking • Problem solving • Critical thinking	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interperson**	Students would be able to – * Apply Trigonometric ratios in solving day to day life situation. *develop problem

	*Angles of elevation / depression should be only 30°, 45°, 60°. * Word problems on Heights and Distances.	life *Identify difference of angle of elevation and angle depression	**APPLICATION:** * used in developing computer music: * used in measuring the height of a building or a mountain. * The distance of a building from the viewpoint and the elevation angle can easily determine the height of a building using the trigonometric functions. **UNDERSTANDING:** ***** compute angle of elevation and angle of depression using Trigonometric ratios in solving day to day life situation.	**al Intelligence Intraperson al Intelligence**	solving skills
NOVEMBER NO. OF DAYS 16	Circles • Secant and Tangents of a circle • Theorems on tangents to a circle	The Learner will be able to *Tangent to a circle at, point of contact *To Prove the tangent at any point of a circle is perpendicular to the radius through the point of contact. *to Prove the lengths of tangents drawn from an external point to a circle are equal	**KNOWLEDGE:** ***** identify circle and its parts *find the difference b/w tangent and secant * proofs of theorems **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:** *Verification of properties of circle using Geo board. *Learning by doing hands on activity **UNDERSTANDING:** ***** derives proof all circle theorems Use concept of tangent to circles in solving given problems	• **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematical Intelligence** • **Interpersonal Intelligence Intrapersonal Intelligence**	The Learner would be able to *Identify concept one point of intersection , two point of intersection, no point of intersection *To know difference about tangent and secant * derives proof all circle theorems Use concept of tangent to circles in solving given problems
	Area related to circles *Circumference and area of a circle. *Length of an arc of a circle. *Area of	The Learner will be able to *Apply formula of area , circumference of circle *Find difference between sector and segment *Understand concept of central angle *Find area and perimeter	**KNOWLEDGE:** ***** Circumference and area of a circle. *Areas of sector and segment of a circle. **SKILLS:** • Analytical thinking • Problem solving • Critical thinking **APPLICATION:**	• **Computation Skill** • **Kinesthetic intelligence** • **Verbal-linguistic Intelligence** • **Logical-Mathematic**	Students would be able to * Recall the concept circle and parts of the circle. * To identify appropriate formula to find Length of an arc, area of sector and

	sector and segment of a circle *Problems on central angle of 120° are to be avoided.	Plane figures involving triangles, simple quadrilaterals and circle. *Problem solving skill of area related to circle in real life	* Cycle wheels, wheel barrow (thela), dartboard, round cake, papad, drain cover, various designs, bangles, brooches, circular paths, washers, flower beds, etc. are some examples of such objects So, the problem of finding perimeters and areas related to circular figures is of great practical importance. **UNDERSTANDING:** * able to find circumference and area of circle * differentiate b/w sector and segment * able to finf Length of an arc of a circle. *compute Area of sector and segment of a circle	**al Intelligence** • **Interpersonal Intelligence** **Intrapersonal Intelligence**	segment of a circle *to develop computational skill.
	REVISION of PT 3				
	CONDUCTION OF PT3 (Fourth week of November)				
December no. of days 18	**REVISION / PREBOARD 1**				
January no of days : 18	**REVISION / PREBOARD 2**				
February no. of days: 3	**REMEDIAL CLASSES**				
MARCH	**CLASS X – BOARD EXAM**				