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| **Annual Pedagogical Plan Subject: Mathematics Class X** | | | | |
| **Unit** | **Learning Objectives** | **Methodology** | **Activities** | **Learning Outcomes** |
| Chapter-1 REAL NUMBERS | 1). Euclid‘s division lemma, Euclid‘s division algorithm and the Fundamental theorem of Arithmetic.  2). Compute the HCF of two or more integers.  3). Expressing positive integers as the product of prime integers.  3). Compute the LCM of two or more integers.  4). Prove the irrationality of numbers.  5). Decimal representation of a rational number.  6). Terminating or non terminating repeating.  7). The prime factorisation of the denominator of a rational number completely reveals the nature of its decimal representation. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. Quiz activity. 5. Audio Visual. 6. Solving questions. | Quiz on real numbers.  Audio Visual Aids: Access the videos relevant from the YouTube resource.  <https://www.youtube.com/watch?v=qkxLNSwop7c>  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :   1. recall Euclid‘s division lemma and Euclid‘s division algorithm. 2. apply Euclid‘s division algorithm to calculate HCF of two or three positive integers. 3. understand the fundamental theorem of arithmetic and compute HCF and LCM of two or three numbers. 4. Verifying when a number expressed in the exponential form can end with digit zero. 5. Understand and apply, for any two positive integers a, b HCF (a, b )X LCM (a,b) = a x b. 6. understand that if p is prime number and p divides a2, a>0 then p divides a. 7. prove irrationality of numbers-Proof by contradiction. 8. verify that the decimal expansion of every rational number is terminating or Non-terminating repeating. |
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| Chapter-2 POLYNOMIAL | 1). Polynomial, degree, coefficients, constants, zeroes, factors of polynomial.  2). Identify linear, quadratic and cubic polynomial.  3). Zeroes of a polynomial and its graph.  4). Splitting middle term of a quadratic polynomial.  5). Relation between zeroes and the coefficient of the polynomial.  6). zeroes of a bi quadratic polynomial. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. Graph activity. 5. Audio Visual. 6. Solving questions. | Graph drawing.  Audio Visual Aids: Access the videos relevant from <https://www.youtube.com/watch?v=jWkbSxqDgQI>  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :   1. recall and review polynomial, degree, coefficients, constants, zeroes, factors of polynomial. 2. identify linear, quadratic and cubic polynomial. 3. analyze that the zeroes of a polynomial are the x-coordinate of the point where the graph of y = p(x) intersects the x-axis. 4. splitting middle term of a quadratic polynomial and find its zeroes. 5. solve problems based on the relation between zeroes and the coefficient of the polynomial. 6. find the remaining zeroes of a bi quadratic polynomial if two of its zeroes are given |
| Chapter-3 PAIR OF LINEAR EQUATIONS IN TWO VARIABLES | 1). general form of a pair of linear equations in two variables.  2. condition for consistency and inconsistency of a pair of linear equations in two variables.  3). represent and solve a pair of linear equations in two variables graphically and algebraically.  4). solve the word problems to a pair of linear equations in two variables. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. Graph activity. 5. Solving questions. | Inter-disciplinary with Physical Education (Sports) and Drawing graph.  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :  1. identify and understand the general form of a pair of linear equations in two variables.  2. represent and solve a pair of linear equations in two variables graphically and algebraically.  3. differentiate from the graph of a system of linear equations as consistent or inconsistent.  4. solve a pair of linear equations in two variables using substitution method, elimination method and cross-multiplication method.  5. understand the condition for consistency and inconsistency of a pair of linear equations in two variables.  6. interpret and to solve the word problems to a pair of linear equations in two variables  7. identify and to solve the equations reducible to a pair of linear equations in two variables. |
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| Chapter - 4 QUADRATIC EQUATIONS | 1. general form of a Quadratic Equation.  2. solving quadratic equations.  3. nature of roots of a quadratic equation. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. Audio Visual Aids activity. 5. Activity. 6. Solving questions. | Audio Visual Aids: Access the videos relevant from https://www.youtube.com/watch?v=ZQ-NRsWhOG  Factorization by paper cutting and pasting.  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :  1. identify the general form of a Quadratic Equation.  2. understand the meaning of roots of a quadratic equation.  3. understand the methods of solving quadratic equation by a) Factorisation method and using quadratic formula.  4. understand the nature of roots of a quadratic equation and solving related questions.  5. framing quadratic equation from a given word problem and solving it. |
| Chapter - 5 ARITHMETIC PROGRESSIONS | 1. identifying an AP.  2. first term and the common difference of an AP and find the nth term of an AP.  3. find the sum of the first n terms of an AP.  4. solving situational problems in an A.P. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. PPT activity. 5. paper cutting and pasting activity. 6. Solving questions. | Power Point Presentations  To check whether a given sequence is an AP or not by paper cutting and pasting.  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :  1). identify an AP.  2). identify the first term and the common difference of an AP  3. find the nth term of an AP.  4. find the sum of the first n terms of an AP.  5. solve questions. |
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| Chapter-6 TRIANGLES | 1). To define the term “similar figures”.  2). conditions of similarity for two polygons with the same numbers of sides.  3). conditions of similarity for triangles.  4. “Basic Proportionality Theorem” and its converse.  5). AAA (AA), SSS and SAS similarity criterion.  6). theorems related to area of similar triangles and the Pythagoras. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. paper cutting and pasting activity. 5. Solving questions. | Verify Pythagoras theorem by paper cutting and pasting.  Assignments with HOT questions and solve previous years board exams questions for gifted students.  Assignment with basic questions from simple concept for slow learner. | Students were able to :  1). explain the concept of similarity.  2). prove the basic proportionality theorem.  3). explain converse BPT.  4). Apply the AAA similarity criterion, the SSS similarity criterion and the SAS similarity criterion.  5). prove the theorems related to the areas of similar triangles as well as the Pythagoras Theorem and its converse.  6). use the results obtained from the theorems and solve problems. |
| Chapter - 7 COORDINATE GEOMETRY | 1). distance between two points whose coordinates are given. Distance formula.  2). coordinates of a point that divides a line segment joining two points of known coordinates internally in a given ratio. Section formula  3). the ratio in which a given line segment joining two points of known coordinates is divided internally by a given coordinate of point. Section formula.  4). area of a triangle using the coordinates of its vertices. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. Graph paper activity. 5. Audio Visual Aids activity. 6. Solving questions. | To verify the distance formula using graph paper.  Quiz  Audio Visual Aids: Access the videos relevant from  Section formula:  https://www.youtube.com/watch?v=6KpDWu5gKww- | Students were able to :  1). understand the terms abscissa, ordinate, quadrant.  2). find the distance between two points in a plane using distance formula.  3). understand the section formula and its corollary- midpoint formula and its applications.  4). find the type of triangle formed when the coordinates of 3 points are given and type of quadrilateral formed when the coordinates of 4 points are given.  5). understand the formula for finding area of a triangle in a plane and its applications. Also, understand the condition for collinearity. |
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| Chapter – 8 INTRODUCTION TO  TRIGONOMETRY | 1. Trigonometric Ratios of a right angled triangle:  Sin , Cos , tan, Cosec , Sec & Cot  2. Trigonometric Ratios of Some Specific Angles: 0 0, 30°, 45°, 60° and 90°  3. Trigonometric Ratios of Complementary Angles  4. Trigonometric Identities | 1. Warm-up session, asking questions. 2. PPT. 3. Discussion. 4. Solving questions. | PPT on introduction of trigonometry  Quiz | Students were able to :  1). use trigonometric ratios of an acute angle of a right angled triangle.  2). work out the trigonometric ratios of specific angles such as 0⁰, 90⁰, 45⁰, 60⁰ and 30⁰ and the trigonometric ratios of complementary angles.  3). prove trigonometry identity. |
| Chapter-9 SOME APPLICATIONS OF TRIGONOMETRY | 1). the use of studying trigonometry  2). line of sight, angle of elevation and angle of depression.  3). when the observer moves towards the perpendicular distance the angle of elevation increases and moves away the angle of elevation decreases.  4). the angle of elevation and angle of depression is always acute angles.  5). draw correct and appropriate figures.  6). solve problem. | 1. Warm-up session, asking questions. 2. PPT. 3. Discussion. 4. Solving questions. | Making of clinometer and use it to measure the angles.  Audio Visual Aids: Access the videos relevant from  https://www.youtube.com/watch?v=0Cz2DJ\_bujo | Students were able to :  1). Find angle of a right triangle when two sides are given.  2). Find one side of a right triangle when an acute angle and one of the other two sides are given.  3). Two right triangles having common base or perpendicular.  4). Use of two right triangles when length of one side of each triangle is equal or a relation between them is known.  5). Right angled triangles formed by angle of depression.  6). The skill of drawing accurate figures, skill of interpretation and skill of solving with appropriate method. |
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| Chapter-10 CIRCLES | 1). Tangent and secant to a Circle.  2). point of contact  3). the radius through  the point of contact with the circle is at  right angles to the tangent and its Theorems  4). Number of Tangents from a Point on a Circle and its theorem. | 1. Warm-up session, asking questions. 2. Acitvity 3. Solving questions. | Verify using the method of paper cutting, pasting and folding that the lengths of tangents drawn from an external point are equal.  Quiz | Students were able to :  1). explain the concepts of a tangent and a secant to a circle.  2). prove theorems and solve exercises related to the tangents of a circle. |
| Chapter -11 CONSTRUCTIONS | 1). Division of a Line Segment  2). similar to a given triangle as per  given scale factor.  3). Construction of Tangents to a Circle | 1. Explaining and demonstrating. | Exercise questions from NCERT book. | Students were able to :  1). divide a line segment in a given ratio using a compass.  2). construct a triangle similar to a given triangle as per the specified scale factor.  3). construct a pair of tangents from an external point to a given circle.  4). mathematically prove these constructions. |
| Chapter-12 AREAS RELATED TO CIRCLES | 1). Perimeter and Area of a Circle.  2). length of an arc of a sector.  2). Areas of Sector and Segment of a Circle.  3). Areas of Combinations of Plane Figures. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. activity. 5. Solving questions. | Area of circle formula verification by paper cutting and pasting.  Quiz | Students were able to :  1). Describe various geometrical terms related to a circle, such as chord, radius, diameter, arc, segment, sector and circumference.  2). calculate the length of an arc of a circle and the areas of a sector and a segment of a circle.  3). calculate the areas of combinations of plane figures. |
| Chapter-13 SURFACE AREAS AND VOLUMES | 1). Surface Area of a Combination of Solids  2). Volume of a Combination of Solids  3). Conversion of Solid from One Shape to Another  4). Frustum of a Cone | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. activity.   Solving questions. | 3-D model making of Cube and Cubiod.  Quiz | Students were able to :  1). calculate the surface areas and the volumes of the combination of solids.  2). Explain that when a solid is converted to another solid or multiple solids, either of the same or different shapes, the surface area changes but the volume remains constant.  3) calculate the surface area and the volume of the frustum of a cone. |
| Chapter-14 STATISTICS | 1). Mean of Grouped Data; Direct Method; Assumed Mean Method; Step-deviation method.  2). Mode of Grouped Data  3). Median of Grouped Data.  4). Graphical Representation of Cumulative Frequency Distribution - ogive. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. activity. 5. Solving questions. | PPT  Drawing Graph | Students were able to :  1). calculate the mean and mode of grouped data. 2). calculate the median of grouped and ungrouped data.  3). Represent cumulative frequency distribution as an ogive. |
| Chapter-15 PROBABILITY | 1). Probability — A Theoretical Approach  2). equally likely outcomes.  3). complementary events.  4). impossible event and certain event. | 1. Warm-up session, asking questions. 2. Chalk and Black Board. 3. Discussion. 4. activity. 5. Solving questions. | Play – one act  Quiz | Students were able to :  1). understand the concept of theoretical probability. They  2). explain various terms, such as equally likely outcomes, elementary event, complement of  an event, sure event and impossible event.  3). solve questions based on theoretical  probability. |