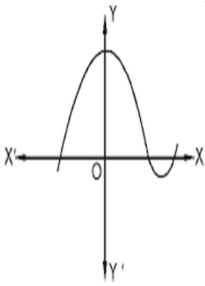


CLASS – X
LESSON PLAN
CHAPTER-2: POLYNOMIALS

Unit	Algebra (Chapter 2: Polynomials)
Class Transaction	Total: 4 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of polynomials. 2. Knowledge of the polynomial having one term, two terms or three terms. 3. Knowledge of the linear, the quadratic and the cubic polynomials. 4. Knowledge of zero of the polynomial.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook 5. FA Activities
Objective	• Students will be able to identify the zeroes of a polynomial $p(x)$ that are precisely the x-coordinates of the points, where the graph of $y = p(x)$ intersects the x-axis, compare the ratios of the coefficients of the polynomial with the sum of the zeroes, product of the zeroes of the polynomial and state the division algorithm for any polynomial through critical thinking.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Zeroes of a polynomial. 2. Geometrical meaning of zeroes of the polynomial. 3. Relationship between zeroes and coefficients of linear, quadratic and cubic polynomial. 4. Division algorithm for polynomials. <u>SKILLS</u>- <i>Students will be able to</i> 1. Identify the graphs of given polynomial. 2. Calculate the number of zeroes from the given graph of the polynomial. 3. Find out the zeroes of given quadratic polynomial and Analyze the relationship between zeroes and the coefficients of given polynomial. 4. Frame the probable quadratic polynomial if zeroes of that polynomial are provided through Creative approach of learning. 5. Use division algorithm for the given pair of polynomials. 6. Solve complex questions based on division algorithm.

Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, Brainstorming, graphic organizer, think pair and share Think Pair and Share: In this activity, students think about a particular question individually, then they form pairs to discuss their answers. Following this, the results are shared in a large classroom discussion. Alternatively, two pairs of students can pair up to compare and discuss answers. This process forces students to think individually, and then allows them to analyze and clarify their response collaboratively. Brain Storming: In this activity, students are asked to generate ideas on a certain topic, category or question while facilitator facilitate and record the answers on the board. Inquiry Based Learning: Inquiry-based learning uses different approaches to learning, including small-group discussion and guided learning. Instead of memorizing facts and material, students learn by doing. This allows them to build knowledge through exploration, experience, and discussion. Inductive and Deductive Learning: In Inductive type students proceed from particular to general statement(example to formula) and in Deductive type students proceed from general to particular. Students are given formula and they solve problems using them. Muddiest Point: Check comprehension and identify confusion, what was most confusing about the material? <i>Brain Storming-</i>The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> ppt and Digital Content would be shared <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Any Other
Resources	Text Book: NCERT text book for Mathematics Reference Book

	CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do some questions from NCERT in their HW notebooks. HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness.....1 mark Content.....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	Through Pen Paper Test Students will be assessed creatively and critically 3 UNIT TESTS (20, 30, 30)80 Marks MID TERM EXAMINATION80 Marks HALF YEARLY EXAMINATION 80 Marks PRE BOARD-I EXAMINATION 80 Marks PRE BOARD-II EXAMINATION 80 Marks ANNUAL BOARD EXAMINATION 80 Marks PERIODIC TEST Average of the best two tests to be taken that will have a weightage of 10 marks. Best 2 Tests out of: Units tests, Midterm examination, Half Yearly examination. INTERNAL ASSESSMENT20 Marks - Periodical Test 10 Marks - Note Book Submission 05 Marks - Lab Practical (Subject enrichment) 05 Marks Through lab Practical Students are assessed for Collaboration, Character building
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> - Encouragement for referring other resources <i>For weak students:</i> - Buddy help to be provided - Provide grade-up classes

	<i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.
Assessment Questions	• If $p(x) = 2 - 3x + 5$, then find $p(-1)$. • Find a quadratic polynomial whose sum and product of roots are 2, 4 • If $(x + a)$ is a factor of $2 + 2ax + 5x + 10$, find a. • The following figure shows the graphs of $y = p(x)$, where $p(x)$ is a polynomial. Find the zeroes of the polynomial.  • If α and β are the zeroes of the polynomial $x^2 - 5x + 3(k - 1)$ and $\alpha - \beta = 11$, find the value of k.

DAY	ONE
Objective	• Enhance the ability to identify the polynomials of degrees 1, 2 and 3 i.e. linear, quadratic and cubic polynomials. • State that a quadratic polynomial in x with real coefficients is of the form $ax^2 + bx + c$ where a, b and c are real numbers with $a \neq 0$ using analytical approach of understanding.
Assessment of qualifying knowledge	Different polynomial based assignment will be provided to find different types of polynomials and analyzing their coefficients.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and identify the coefficients of polynomials by converting them in their standard forms.</i> <u>SKILLS and COMPETENCIES</u> <i>Students will be able to Analyse effectively and will be able to critically explain the coefficients of different polynomials.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, think pair and share Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What is a polynomial? • What is the special name of the polynomial having one term, two terms or three terms? • How will you identify the linear, the quadratic and the cubic polynomials? Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning (Critical Thinking and Problem Solving)</u> Students would be asked to write different real life situations in which they are supposed to analyze situations where polynomials are involved. The facilitator would take rounds and ensure that each learner is engaged. Guided practice: 10 min The students will solve the questions from NCERT book, solved examples before Ex 2.1 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving the questions. Independent Practice: Students will go through the solved examples before Ex 2.1 of NCERT text book. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book

	CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral Test (5 minutes)
DAY	TWO
Objective	Students will be able to • Comprehend and Explain the zeroes of a polynomial $p(x)$ that are precisely the x-coordinates of the points, where the graph of $y = p(x)$ intersects the x-axis. • Analyse that a quadratic polynomial can have at most 2 zeroes and a cubic polynomial can have at most 3 zeroes. • Compare the ratios of the coefficients of equations, the learners will be able to explain the behaviour of lines, i.e, intersecting, parallel or coincident critically • Give sum and product of the zeroes of a quadratic polynomial $ax^2 + bx + c$ i.e. sum of the zeroes = $-b/a$, product of the zeroes = c/a.
Assessment of qualifying knowledge	Worksheet based of finding the roots of polynomials will be assessed in a collaborative manner through group activity.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will learn to find roots of quadratic polynomial and understand the relation between coefficients and roots of polynomials.</i> <u>SKILLS and COMPETENCIES</u>- <i>Students will be able to analyse the sum of the zeroes = $-b/a$, product of the zeroes = c/a.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Brainstorming, think pair and share Recapitulation: 5 min Brainstorming on the previously taught concept would be done. Discussion of topic through Collaborative Learning: 15 min (Critical Thinking, Collaboration) An oral quiz will be taken and students will be asked to identify the coefficients of x and y and will be able to relate them with the roots of polynomial. Guided practice: 15 min The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 2.2 in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher’s guidance. Independent Practice: Students will complete the remaining HW parts given in Exercise 2.2 in their Math HW notebook. Students who would face difficulty in solving the problem would solve with the help of their buddies. Closure: 5 min

	A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	Oral quiz (5 minutes)
DAY	THREE
Objective	State the division algorithm for any polynomial $p(x)$ and any non-zero polynomial $g(x)$, there are polynomials $q(x)$ and $r(x)$ such that $p(x)=g(x)q(x)+r(x)$ where $r(x) = 0$ or $\text{degree } r(x) < \text{degree } g(x)$ through Critical analysis .
Assessment of qualifying knowledge	Problem solving approach will be checked by giving certain questions of division of two polynomials to check the understanding of division algorithm.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will develop the ability to analyze that whether the given polynomial is divisible by another or not by checking on to its remainder's value becoming zero or not.</i> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to critically apply the concept of division algorithm in given situations and collaboratively analyze and identify the number of roots of the polynomial provided.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: graphic organizer Recapitulation: <u>5 min</u> Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical thinking) Exemplar questions will be discussed and students will be able to solve different questions per group and then the questions will be crosschecked. Digital content will be used. The facilitator will take rounds and help students with their doubts. Guided Practice: <u>15 min</u> The students will solve the questions from NCERT book of Exercise 2.3 in their notebook in the class with the help of their teacher. The teacher will ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in Exercise 2.3 in their Math HW notebook. Closure: <u>5 min</u> A short oral test would be taken to check proper assimilation of the topic

	discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	Written test (5 minutes)
DAY	FOUR
Objective	Use division algorithm to factorize higher order polynomials and hence apply the concept to given situations.
Assessment of qualifying knowledge	Problem solving approach will be checked by giving certain questions of division of two polynomials to check the understanding of division algorithm.
Learning Outcomes	<u>KNOWLEDGE-</u> <i>Students will develop the ability to analyze where can division algorithm be used to factorize the given polynomials.</i> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to critically apply the concept of division algorithm in given situations and collaboratively analyze and identify the number of roots of the polynomial provided.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Collaborative Study Recapitulation: 5 min Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Critical thinking) The facilitator would discuss various examples of polynomials and how can division algorithm be used to find all the zeroes of the given polynomial. Guided Practice: 15 min The students will solve the questions from NCERT book of Exercise 2.3 in their notebook in the class with the help of their teacher. The teacher will ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in Exercise 2.3 in their Math HW notebook. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar

Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	Written test (5 minutes)