BAL BHARATI PUBLIC SCHOOL, PITAMPURA,DELHI – 110034

SUBJECT- MATHEMATICS

Class X

CHAPTER- 2

TOPIC: Polynomials

STEP 1:- GUIDELINES AND INTRODUCTION

Guidelines:

Dear students,

Kindly refer to the following notes/video links from the Chapter- Polynomials" and thereafter do the questions in your Maths notebook.

(Chapter2 – Part II)

LINK FOR THE CHAPTER: http://ncert.nic.in/textbook/textbook.htm?jemh1=2-15

INTRODUCTION

We have already learnt about the geometric meaning of the zeroes of a polynomial,

relationship between zeros and coefficient of a polynomial and how to form a polynomial,

given its zeroes.

Today we are going to learn about the division algorithm for polynomials.

Refer to the link to recall the long division method used for dividing two polynomials leant in class IX.

https://www.youtube.com/watch?v=vs2GYsMn9vw&feature=youtu.be

STEP 2:

Subtopic:

  (i)   Division Algorithm for Polynomials
  (ii)   Finding remaining zeroes of a biquadratic polynomial, given its two zeroes.

STEP 3: Key Points and Important Links for Reference

  (i)   Division Algorithm for Polynomials

If $p(x)$ and $g(x)$ are any two polynomials with $g(x) \neq 0$, then we can find a polynomial $q(x)$ and $r(x)$ s.t $p(x) = g(x) \times q(x) + r(x)$

where $r(x)=0$ or degree of $r(x) <$ degree of $g(x)$

Refer to the following link to learn more about Division Algorithm:

(a) Verification of division algorithm:

https://www.youtube.com/watch?v=FsotIB0Usvw

(b) Ex 2.3 – Q -1
https://www.youtube.com/watch?v=MzZQWjzAUtM&feature=youtu.be

(c) Ex 2.3 –Q-2 (iii)
https://www.youtube.com/watch?v=rgGzrNE86j4&feature=youtu.be

Example: Obtain all the zeroes of a polynomial of $x^4 + 2x^3 - 13x^2 - 14x + 24$, if two of its zeroes are 1, -4.

Let $p(x) = x^4 + 2x^3 - 13x^2 - 14x + 24$ be a polynomial and $x = 1$ and $x = -4$ are two of its roots and we want to find the other two roots

$x = 1$ and $x = -4$ are roots of $p(x)$

$\Rightarrow (x - 1)$ and $(x + 4)$ are factors of $p(x)$

$\Rightarrow (x - 1)(x + 4)$ is a factor of $p(x)$

$\Rightarrow x^2 + 3x - 4$ is a factor of $p(x)$

Dividing $p(x)$ by $x^2 + 3x - 4$, we get quotient $q(x) = x^2 - x - 6$

Therefore, $x^4 + 2x^3 - 13x^2 - 14x + 24 = (x - 1)(x + 4)(x^2 - x - 6)$

$p(x) = 0 \Rightarrow (x - 1)(x + 4)(x^2 - x - 6) = 0$

$(x - 1)(x + 4)(x^2 - 3x + 2x - 6) = 0$

$\Rightarrow (x - 1)(x + 4)(x(x - 3) + 2(x - 3)) = 0$

$\Rightarrow (x - 1)(x + 4)(x - 3)(x + 2) = 0$

$\Rightarrow (x - 3)$ and $(x + 2)$ are other two factors of $p(x)$

$\Rightarrow x = 3$ and $x = -2$ are other two roots of $p(x) = x^4 + 2x^3 - 13x^2 - 14x + 24$

Refer to the following link for Ex 2.3 –Q3:

https://www.youtube.com/watch?v=ojh-Xs7FJ18&feature=youtu.be

ASSIGNMENT

1) NCERT Ex 2.3, Q1 TO Q4 (to be done in cw/hw register)

   (Q2 and 3 of the assignment to be done in practice register)

2) Apply division algorithm to find the quotient q(x) and the reminder r(x) on dividing f(x) = $x^3 - 6x^2 + 11 x - 6$ by g(x) = $x^2 + x + 1$.

3) Obtain all the zeroes of a polynomial f(x) = $x^4 - 3x^3 - x^2 + 9 x - 6$, if two of its zeroes are $\sqrt{3}$ and $-\sqrt{3}$.

NOTE

1. Refer to the following links to practice more questions:

a)
https://diksha.gov.in/play/content/do_31279570461884416011633?referrer=utm_source%3Ddiksha_mobile%26utm_content%3Ddo_31279645524094156811824%26utm_campaign%3Dshare_content

b) From Khan Academy Assignments

     https://www.khanacademy.org/math/in-in-grade-10-ncert

c) www.examfear.com

d) http://www.ei-india.com/mindspark-math (free trial for 60 days)