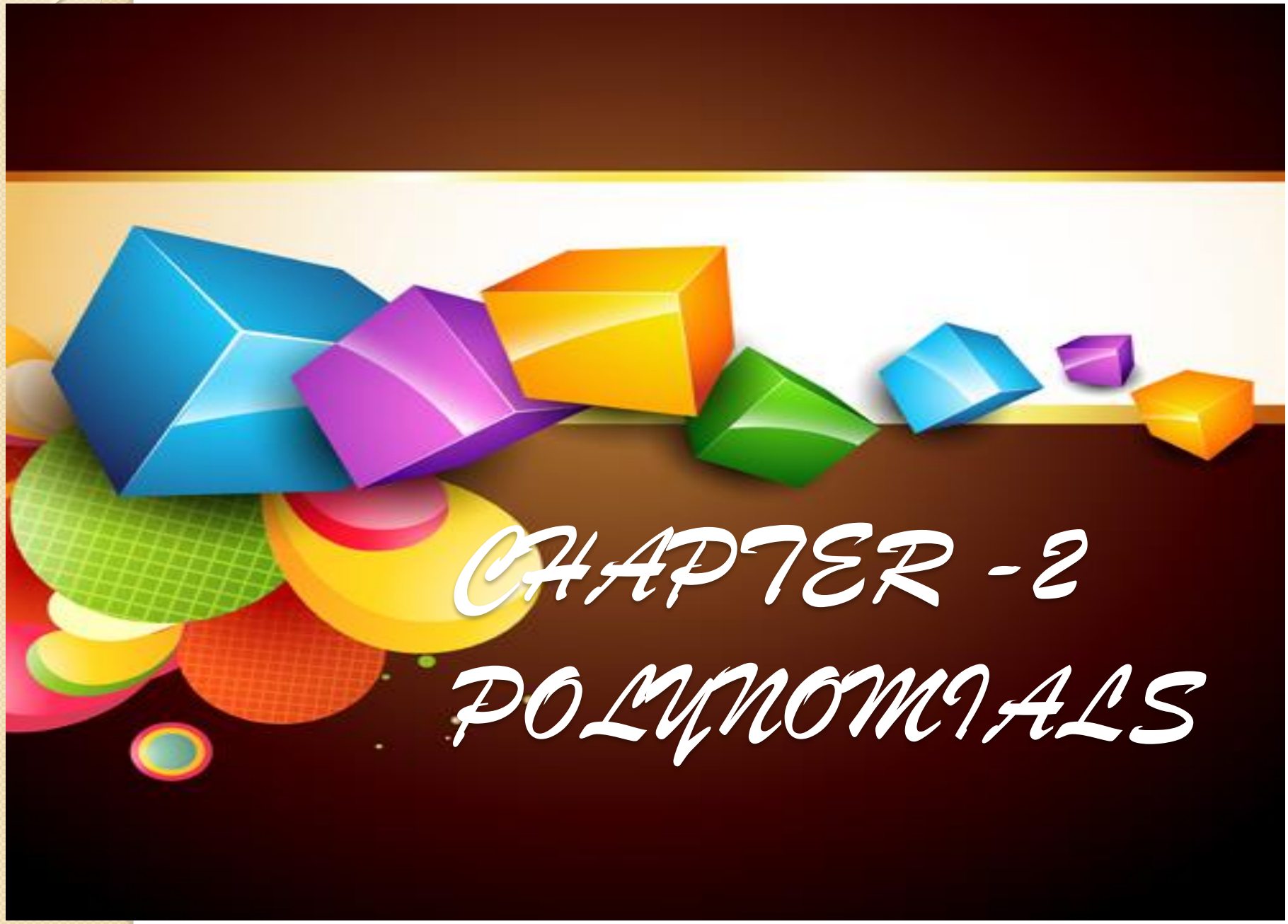
CHAPTER -2
POLYNOMIALS

1) Algebraic Expressions: Any expression containing constants, variables, and the operations like addition, subtraction, etc. is called as an algebraic expression.
***For example*:** $5x$, $2x - 3$, $x^2 + 1$, etc. are some algebraic expressions.

2) Polynomials: The expression which contains one or more terms whose variables have non-negative integral powers is called a polynomial. A polynomial can have any number of terms.
***For example*:** 10, $a + b$, $7x + y + 5$, $w + x + y + z$, etc. are some polynomials.

(3) Polynomials in One Variable: The expression which contains only one type of variable in entire expression is called a polynomial in one variable.
***For example*:** $2x$, $a^2 + 2a + 5$, etc. are polynomials in one variable

4) Term: A term is either a single number or variable and it can be combination of numbers and variable. They are usually separated by different operators like +, -, etc.
***For example*: Consider an expression 6x - 7. Then, the terms in this expression are 6x and -7.**

(5) Coefficient: The number multiplied to variable is called as coefficient.
***For example*: The coefficient of the term 2x will be 2.**

(6) Constant Polynomials: An expression consisting of only numbers not variables is called as constant polynomial.
***For Example*: 7, -27, 3, etc. are some constant polynomials.**

(7) Zero Polynomial: The constant polynomial 0 is called as zero polynomial.

(8) Polynomials in One Variable:
Let us take an example to understand it:
If the variable in a polynomial is x, then we can denote the polynomial by p(x) or q(x) etc.
***For example*: $p(x) = 7x^2 + 7x + 7$, $t(r) = r^3 + 2r + 1$, etc.**

(9) Monomials: The expressions which have only one term are called as monomials.
***For Example*: $p(x) = 3x$, $q(a) = 2a^2$, etc. are some monomials.**

(10) Binomials: The expressions which have two terms are called as binomials.
***For example*: $r(x) = x + 10$, $c(z) = 7z^2 + z$ etc. are some binomials**

(11) Trinomials: The expressions which have three terms are called as trinomials.

***For example*: $p(x) = 7x^2 + x + 7$, $d(t) = t^3 - 3t + 4$, etc. are some trinomials.**

(12) Degree of polynomial: The highest power of the variable in a polynomial is called as the degree of the polynomial.

***For Example*: The degree of $p(x) = x^5 - x^3 + 7$ is 5.**

Note: The degree of a non-zero constant polynomial is zero.

(13) Linear polynomial: A polynomial of degree one is called a linear polynomial.

***For Example*: $2x - 7$, $s + 5$, etc. are some linear polynomials.**

(14) Quadratic polynomial: A polynomial having degree two is called a quadratic polynomial. In general, a quadratic polynomial can be expressed in the form $ax^2 + bx + c$, where $a \neq 0$ and a, b, c are constants.

For Example: $x^2 - 9$, $a^2 + 7$, etc. are some quadratic polynomials.

(15) Cubic polynomial: A polynomial having degree three is called a cubic polynomial. In general, a quadratic polynomial can be expressed in the form $ax^3 + bx^2 + cx + d$, where $a \neq 0$ and a, b, c, d are constants.

For *Example*: $x^3 - 9x + 2$, $a^3 + a^2 + a + 7$, etc. are some cubic polynomials.

(16) General expression of polynomial: A polynomial in one variable x of degree n can be expressed as:

$a_n x^n + a_{n-1} x^{n-1} + ... + a_1 x + a_0$

where $a_n \neq 0$ and $a_0, a_1, ... a_n$ are constants.

(17) Points to remember :

(i) A non-zero constant polynomial has no zero.

(ii) A linear polynomial has one and only one zero.

(iii) A zero of a polynomial might not be 0 or 0 might be a zero of a polynomial.

(iv) A polynomial can have more than one zero.