

Mathematics 9

Section 5.1 - Introduction to Polynomials

A quick review!!

When we refer to groups of numbers, there are two possibilities that we can deal with:

EXPRESSIONS: A GROUP OF NUMBERS & LETTERS, BUT NO EQUAL SIGN.

$$2n^2 + 4n - 2 \qquad n - 2$$

EQUATION: A GROUP OF NUMBERS & LETTERS, BUT HAS AN EQUAL SIGN.

$$6n + 5 = 2 \qquad 8n^2 - 9n = 12$$

EXPRESSIONS and EQUATIONS can be further classified as POLYNOMIALS. A POLYNOMIAL is one or more terms joined by ADDITION or SUBTRACTION. Each term must have a WHOLE NUMBER EXPONENT and the exponent CANNOT be in the denominator.

TERM: A NUMBER, VARIABLE, OR PRODUCT OF NUMBERS AND VARIABLES.

$$-3 \quad 6n \quad x^3 \quad 5y \quad -7z \quad 8ac$$

VARIABLE: ANY LETTER THAT IS IN PLACE OF A NUMBER. MULTIPLE NUMBERS CAN TAKE THE PLACE OF A SINGLE VARIABLE.

$$a, b, c, d, \dots$$

COEFFICIENT: A NUMBER THAT IS DIRECTLY JOINED TO A VARIABLE BY MULTIPLICATION.

$$9x \rightarrow \text{coeff} = 9$$
$$-7y^2 \rightarrow \text{coeff} = -7$$

CONSTANT: A NUMBER BY ITSELF THAT DOES NOT CHANGE WHEN THE VARIABLE CHANGES.

$$6y + 9 \rightarrow \text{constant} = 9$$

$$\text{Page 1 of 2} \quad 4z^2 - 4z - 7 \rightarrow \text{constant} = -7$$

New material:

We can classify polynomials in two different ways.

1. By the NUMBER OF TERMS PRESENT

MONOMIAL \rightarrow HAS ONLY ONE TERM

$$5x, 6, -9n^2$$

BINOMIAL \rightarrow HAS TWO TERMS

$$4y-7, 3n^2+9$$

TRINOMIAL \rightarrow HAS THREE TERMS

$$6x^2-7y+8$$

2. By the DEGREE OF THE POLYNOMIAL

THE TERM WITH THE HIGHEST TOTAL OF EXPONENTS DETERMINES THE DEGREE OF THE POLYNOMIAL.

$$4x^2-8y+7 \rightarrow 2^{\text{ND}} \text{ DEGREE POLYNOMIAL}$$

$$4xy+6 \rightarrow 2^{\text{ND}} \text{ DEGREE POLYNOMIAL (ADDING EXPONENTS IN ONE TERM)}$$

$$7z^4+2n \rightarrow 4^{\text{TH}} \text{ DEGREE POLYNOMIAL}$$

$$4y \rightarrow 1^{\text{ST}} \text{ DEGREE}$$

$$8 \rightarrow 0 \text{ DEGREE}$$

One additional fact:

Polynomials are often written in DESCENDING order based on the value of the EXPONENTS. The coefficients out front do NOT play a role in the order of the terms.

$$5y+3x^2-7 \text{ should be } 3x^2+5y-7$$

$$8-4n-2n^2 \text{ should be } -2n^2-4n+8$$

