

Chapter 6 – Polynomial Functions: Part 1

In this chapter, you will...

- 1. Learn about the characteristics of polynomials,**
- 2. Add, subtract, multiply, and divide polynomials,**
- 3. Use binomial expansion to do powers of binomials,**
- 4. Evaluate polynomial functions, and**
- 5. Find the function of the function of polynomials given the roots.**

Polynomial:

A monomial or the sum of 2 or more monomials

Examples:

$$3a^2b^3$$

$$x^2 + 4x - 45$$

$$2n^4 - 6n^2 - 5n + 7$$

$$y^3z - 8y^2z^4 - 6yz^2 - 11z$$

Degree of a Polynomial:

The greatest degree of all the monomials

$$3a^2b^3 \quad \text{Degree: } 5$$

$$x^2 + 4x - 45 \quad \text{Degree: } 2$$

$$2n^4 - 6n^2 - 5n + 7 \quad \text{Degree: } 4$$

$$y^3z - 8y^2z^4 - 6yz^2 - 11z \quad \text{Degree: } 6$$

Leading Coefficient of a Polynomial:

The coefficient of the greatest degree monomial of a polynomial

$$3a^2b^3 \quad \text{L. C.: } 3$$

$$x^2 + 4x - 45 \quad \text{L. C.: } 1$$

$$2n^4 - 6n^2 - 5n + 7 \quad \text{L. C.: } 2$$

$$y^3z - 8y^2z^4 - 6yz^2 - 11z \quad \text{L.C.: } -8$$

Names of Polynomials:

Each polynomial has 2 names: one for the degree and the other for the number of terms.

| Degree | Name |
|--------|-----------|
| 0 | Constant |
| 1 | Linear |
| 2 | Quadratic |
| 3 | Cubic |
| 4 | Quartic |

| Terms | Name |
|-------|-----------|
| 1 | Monomial |
| 2 | Binomial |
| 3 | Trinomial |
| 4 | 4 terms |
| 5 | 5 terms |

$$2x^2 - 5$$

Quadratic Binomial

$$y^3 + 8y^2 + 6y - 11$$

Cubic with 4 terms

$$-4.6$$

Constant Monomial

$$6n^2 - 5n + 7$$

Quadratic trinomial

$$7m^5 - 3m^3 + 2m + 9$$

5th degree polynomial with 4 terms

Polynomials need to be written in standard form.

Greatest degree to least

$$7a - 3a^2 - 4 + 2a^3$$

$$2a^3 - 3a^2 + 7a - 4$$

$$9u - 4u^3 + 8 - 6u^5 + u^2$$

$$-6u^5 - 4u^3 + u^2 + 9u + 8$$

Adding and Subtracting Polynomials:

$$(7a - 3a^2 + 5) + (5a^2 + 9 - 2a) = 2a^2 + 5a + 14$$

$$(4x^3 - 12 + 5x) + (-6x^2 + 3x^3 - 7x) = 7x^3 - 6x^2 - 2x - 12$$

$$(6n^5 + n^3 - 8) - (4n^3 + 3 - 2n^5 - 7n) = 8n^5 - 3n^3 + 7n - 11$$

$$(8v^2 - 2v^3 - 3v) - (-3v^3 + 4v^2 - 5) = v^3 + 4v^2 - 3v + 5$$

Assignment:

Adding and Subtracting Polynomials Worksheet