

Unit 6.1 – Classifying & Writing Polynomials in Standard Form

- **Monomial** (ONE) → an expression that's a number, a variable, or a product of a number and one or more variables. ex: $2b$ or $-7xyz$
 (Products)

Ex: Circle an example of a monomial: (12) ~~$4x$~~ (2 -terms) $(-3y^4)$ $(\frac{a^2b}{2}) \rightarrow \frac{1}{2}a^2b$
 ~~$x^2 - 4x + 5$~~ (3 -terms) $(\frac{c}{3}) \rightarrow \frac{1}{3}c$ ~~$\frac{5n^3}{m}$~~ Not a monomial b/c it has a variable in the denominator!

Degree of a monomial → the sum of the exponents of its variables. (Don't include the coefficients)

Example 1: Find the degree of each given monomial.

- a.) $\frac{1}{4}x^1$ → Degree: 1 b.) $3z^2$ → Degree: 2 c.) $7a^4b^2$ → Degree: 6
 d.) -5 → Degree: 0 e.) 0 → Degree: 0 f.) $\frac{x^8}{x^5}$ → Degree: 3
 (Must simplify the expression before giving it a degree.)

Polynomial (many) → a monomial or the sum / difference of two or more monomials.

Ex: Circle an example of a polynomial: $(2x - 5)$ (2 -terms) $(3x^4 - 2x^3 + x - 1)$ (4 -terms) $(4x^5y^3z)$

* This is how you are going to write your polynomials. *

Standard Form of a polynomial → a simplified form of a polynomial where the degree of its monomial terms are written so that the exponents decrease from left to right.

Example 2: Determine if each polynomial is in standard form. If it's not, put it in standard form.

- a.) $9x^3 - 5x^2 - 3x + 4$ → In standard form? Circle: Yes No
 b.) $2x^4 + 3x^2 - x^3 - 1 + 4x$ → In standard form? Circle: Yes No $2x^4 - x^3 + 3x^2 + 4x - 1$
 c.) $(5x) + x^3 - (2x) + 6x^2$ → In standard form? Circle: Yes No $x^3 + 6x^2 + 3x$
 d.) $(3a + 5a) - 4 + 3$ → In standard form? Circle: Yes No $8a - 1$
 (Combine like terms)

Degree of a polynomial → the largest exponent or the largest sum of the exponents of its monomial terms.

Example 3: Determine the degree of each polynomial.

- a.) $x^1 + 2$ → Degree: 1 b.) $2x + x^2 - 3$ → Degree: 2 c.) $a^3 - a^2 + a^4$ → Degree: 4

- d.) $5x^3y - 2x^4y^3 + x^2y$ → Degree: 7
3+1=4, 4+3=7, 2+1=3
- e.) $3mn + 2m^2n^3 - 5m^3n + mn^5$ → Degree: 6
1+1=2, 2+3=5, 3+1=4, 1+5=6

Below is a chart to help you classify each type of polynomial:

Degree	Name Based Degree
0	Constant
1	Linear
2	Quadratic
3	Cubic
4 th degree or higher	"n th " degree

Number of Terms	Name Based # of Terms
1	Monomial
2	Binomial
3	Trinomial
4 terms or more	# - term polynomial

ie: $3x^7$ - 7th degree

ie... $-7a + 3a^3 - 4a^5 + 2a^8 - 5$
 5-term polynomial

Example 4: Classify each polynomial based on its degree and the number of its term(s).

Polynomial	Degree	# of Terms	Classification # of terms
a.) $2x^1 + 5$	1	2	Linear Binomial
b.) $2x^2 - 4 + 5x^3 + 3x^6$	6	4	6 th degree 4-term polynomial
c.) $5x + 3 + x^2$	2	3	Quadratic Trinomial
d.) $2xy^2$	3	1	Cubic Monomial
e.) 12	0	1	Constant Monomial

* When you classify a polynomial, it is the **Degree** then the **# of terms** *