Chapter 8
Polynomials and Factoring

8.1
Add and Subtract Polynomials

Monomial

- A _number, variable, or product of the two_.
- _One term_
  - EX: 4 - number
    y - variable
    4y - product of two

- Degree of a monomial – the _sum_ of all of the _exponents_ of the _variables_
  - EX: $4x^2y^1$
    Degree = 2 + 1 = 3

Polynomial

- A __Monomial__ or __a sum of monomials__
  - EX: $2x^2$ or $2x^2 + x + 1$

- Degree of a polynomial – the ___greatest___ ___degree___ of its terms
  - EX: $2x^2 + 5x^1 + 7$
    - ↑ Degree 2 (greatest)
    - ↑ Degree 1
    - ↑ Degree 0
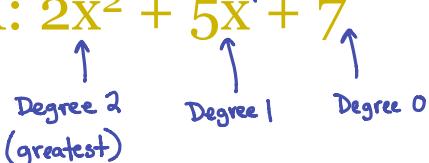
  Degree of Polynomial = 2

- Leading coefficient – the coefficient of the ___first term___ when the polynomial is written in ___descending order (from greatest exponent to least)___

  ◦ EX: $2x^2 + 5x + 7$

  Leading Coefficient = 2
  (LC)

EX:

- Write the polynomial so that the exponents decrease from left to right. Identify the degree and the leading coefficient.
- $7 - 5y^3$

$$-5y^3 + 7 \qquad \text{Degree} = 3$$
$$LC = -5$$

- $-5 + 2x^2 + x^3 - 7x$

$$x^3 + 2x^2 - 7x - 5 \qquad \text{Degree} = 3$$
$$LC = 1$$

- Binomial – a polynomial with __2 terms__
  - EX:
    $$5x + 4$$

- Trinomial – a polynomial with __3 terms__
  - EX:
    $$3x^2 - 2x + 7$$

To add polynomials -

- Add _____like terms_____
  - ▫ REMEMBER: You can only add if the _____Variable_____ AND the _____exponent_____ are the same. ☆ Only add numbers - not exponents
- EX: Find the sum.
- $(6a^2 - 4) + (2a^2 - 9)$

  $\boxed{8a^2 - 13}$

  ☆ Write all answers in descending order

- EX: Find the sum.
- $(5x^3 + 4x^2 - 2x) + (4x^2 + 3x^3 - 6)$

$$8x^3 + 8x^2 - 2x - 6$$

To subtract polynomials -

- Distribute the __negative__ then __add__ __like terms__.
  - Make sure to __switch all signs__ when distributing the negative.
- EX: Find the difference.
- $(4n^2 + 5) - (-2n^2 + 2n - 4)$

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

$6n^2 - 2n + 9$

- EX: Find the difference.
- $(4x^2 - 7x) - (5x^2 + 4x - 9)$

$4x^2 - 7x - 5x^2 - 4x + 9$

$$\boxed{-1x^2 - 11x + 9}$$

EX:

- Write a polynomial that represents the <u>perimeter</u> of the figure.
  - ▫ All sides <u>added</u> up.

$P = \underline{3x+2} + \underline{x+4} + \underline{3x+2} + \underline{x+4}$

$P = 8x + 12$

$3x+2$

$x+4$ $x+4$

$3x+2$