2.1: Operations with Polynomials

- Adding polynomials
  - Ex 1) $(3x^3 + 3x^2 + 5) + (7x^3 - 2x^2 + 4)$

$3x^3 + 3x^2 + 5 + 7x^3 - 2x^2 + 4$

$\boxed{10x^3 + x^2 + 9}$

* when combining like terms, exponents DO NOT change

  - Ex 2) $(7m^3 - 3m^2) + (4 + 5m^2 - 9m)$

$7m^3 - 3m^2 + 4 + 5m^2 - 9m$

$\boxed{7m^3 + 2m^2 - 9m + 4}$

- Subtracting Polynomials
  - Ex 3) $(9k^5 - 6k + 8) - (8k^5 - 7k + 3)$

$9k^5 - 6k + 8 - 8k^5 + 7k - 3$

$\boxed{k^5 + k + 5}$

  - Ex 4) $(10xy - 7x^2y + 8xy^2) - (6x^2y - 13xy + 14xy^2)$

$10xy - 7x^2y + 8xy^2 - 6x^2y + 13xy - 14xy^2$

$\boxed{-13x^2y + 23xy - 6xy^2}$

Multiplying Polynomials

- Ex 5) $5x^1(3x^2+7x^1-4)$

$$15x^3+35x^2-20x$$

* multiply coefficient
* add exponents

- Ex 6) $5w^2x^3(4w^5+6w^2x^7)$

$$20w^7x^3+30w^4x^{10}$$

- Ex 7) $(3x+4)(5x+2)$ FOIL

$$15x^2+6x+20x+8$$

* combine like terms

$$15x^2+26x+8$$

- Ex 8) $(x+7)(9x-6)$

$$9x^2-6x+63x-42$$

$$9x^2+57x-42$$

- Ex 9) $(5x-3)^2$

$$(5x-3)(5x-3)$$

$$25x^2-15x-15x+9$$

$$25x^2-30x+9$$