Section 1.3A: Polynomials

Poly- Nom-ials

Many- number
>1 term

$x+1$, $3x^2+2x-1$

$5x^3+7x^2-2x+17$

$x^{-1}=\frac{1}{x}$

Cannot have a variable in the denominator

Cannot have a variable in a radical $x^{\frac{1}{2}}=\sqrt{x}$

only whole number exponents on variables

Degree of a term = sum of exponents on the variables $3x^4y^2 \leftarrow 6^\circ$

Degree of the polynomial is = highest degree of its terms.

$$\underset{3^\circ}{4x^3}+\underset{2^\circ}{3x^2}\underset{7^\circ}{\underline{\underline{-2x^7}}}+\underset{1^\circ}{6x}-\underset{0^\circ}{108} \leftarrow 7^\circ$$

Leading term is term with highest degree $-2x^7$

Leading coefficient is the coefficient of the leading term -2

Adding & Subtracting Polynomials

Combine 'Like Terms'

same variable with same exponent

$$(15x^2 - 6x + 3) + (-8x^3 - 14x^2 - 17)$$

$$-8x^3 + x^2 - 6x - 14$$

$$(3x^4 - 5x^2 + 3) - (8x^3 + 7x - 5)$$

$$3x^4 - 8x^3 - 5x^2 - 7x + 8$$

Multiplying Polynomials

Distribution

monomial x polynomial

$$3(x^2 + 6) = 3x^2 + 18$$

$$4x^1(3x^2 + 7x - 2) = 12x^3 + 28x^2 - 8x$$

FOIL

$$(3x + 2)(2x - 4)$$

$$6x^2 - 12x + 4x - 8$$

$$6x^2 - 8x - 8$$