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Operations with Polynomials

then the polynomial is of degree n, and the # a_n is called the leading coefficient. A polynomial that is written with descending powers of x is in standard form.

Polynomials with 1,2,3 terms-Monomial, binomial,trinomial

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Add or subtract Polynomials

- +/- coefficients of terms with the same degree.
- Use horizontal or vertical method
- If a term is “missing” use 0 as a place holder

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Examples

- Combine the following

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

$(14x^3+8x^2+4x+2) – (6x^3+4x^2-7)$

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Multiplying

- Distribute (monomial by polynomial)
- FOIL (binomial x)
- To multiply 2 polynomials that have 3 or more terms, each term of 1 polynomial must multiply each term of the other
- Can be done vertically or horizontally

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Special Product Patterns

Sum and Difference

$(u+v)(u-v)=u^2-v^2$ $(x+4)(x-4)$

Square of a Binomial

$(u+v)^2=u^2+2uv+v^2$ $(x+3)^2$

$(u-v)^2=u^2-2uv+v^2$ $(3x-2)^2$

Cube of a Binomial

$(u+v)^3=u^3+3u^2v+3uv^2+v^3$ $(x+2)^3$

$(u-v)^3=u^3-3u^2v+3uv^2-v^3$ $(x-1)^3$

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Examples (Multiply)

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

$(5x+3)(8x-4)$

$(2x-7)(3x^2+x-3)$

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

$(5-6x)^2$

$(2x+9)^3$

$32x-24x^2+16x^3$

$40x^2+4x-12$

$6x^3-19x^2-13x+21$

$4x^2-9$

$25-60x+36x^2$

$8x^3+108x^2+486x+729$