Algebra II

Polynomials

Add, Subtract, and Multiply

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Adding, Subtracting and Multiplying Polynomials

$8x^2 + 3x + 5x^3 - 17$

Write in standard form (highest exponent to lowest)
What is the degree of the polynomial and leading coefficient?

$5x^3 + 8x^2 + 3x^1 - 17$

Degree = 3 (Highest Exponent)

LC = 5

How many terms are there? 4

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Example 1: Add and Subtract Polynomials. Tell degree and number of terms and leading coefficient.

A. $(2x^3 + 9 - x) + (5x^2 + 4 + 7x + x^3)$

$3x^3 + 5x^2 + 6x + 13$

D = 3
LC = 3
#terms = 4

B. $(3 - 2x^2) + (x^2 + 6x + x)$

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

D = 2
LC = -3
#Terms = 3

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Example 2: Now, you try to add and subtract polynomials. Also tell the degree and number of terms and leading coef.

A. $(3x^3 + 7x - 1) + (4x^2 + 6 + 7x + x^3) + (3 + 2x^2)$

$4x^3 + 6x^2 + 14x + 2$

D = 3
LC = 4
#Terms = 4

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

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

D = 3
LC = -7
#terms = 4

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Example 3: Multiplying Polynomials.

A. $(a - 3)(2 - 5a + a^2)$

$2a - 5a^2 + a^3 - 6 + 15a - 3a^2$

$a^3 - 8a^2 + 17a - 6$

B. $(y^2 - 7y + 5)(y^2 - y - 3)$

$y^4 - y^3 - 3y^2 - 7y^3 + 7y^2 + 21y + 5y^2 - 5y - 15$

$y^4 - 8y^3 + 9y^2 + 16y - 15$

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Example 4: Now, you try to multiply polynomials.

A. $(3x - y)(2x^2 - 4xy + y^2)$

$6x^3 - 12x^2y + 3xy^2 - 2x^2y + 4xy^2 - y^3$

$6x^3 - 14x^2y + 7xy^2 - y^3$

B. $(7y^2 - 4y + 3)(-y^2 - 5y + 8)$

$-7y^4 - 35y^3 + 56y^2 + 4y^3 + 20y^2 - 32y - 3y^2 - 15y + 24$

$-7y^4 - 31y^3 + 73y^2 - 47y + 24$

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Conclusion

1. **What do we do to add polynomials?** Like Terms
2. **How do we subtract polynomials?** Add Opposite
3. **What do we do to multiply polynomials?** Distribute
4. **How do you find the degree?** Highest Exponent
5. **How should all answers be written?** Highest Exponent to Lowest
6. **What is a leading coefficient?** # in front of Highest Exponent

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