6.2: Multiplying Polynomials

Example 1) Multiplying a Monomial and a Polynomial
Find each product. Classify the result by the number of terms.

a) $3x^2\left(8x^3 - 4x^2 - 3x + 2\right)$

b) $2a^3b\left(4a^3 + 3a^2b - 4ab^2 - b^3\right)$

Example 2) Multiplying Polynomials
Find each product. Classify the result by the number of terms.

a) $(x - 2)\left(1 + 4x - 3x^2\right)$

b) $\left(x^2 + 3x - 5\right)\left(x^2 - x + 1\right)$

c) $(x + 3)(4x - 1)(3x + 5)$

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

Example 3) Expanding a power of a Binomial
Find each product. Classify the result by the number of terms.

a) $(x + 3y)^2$

b) $(x + y)^3$

c) $(2x - 3y)^3$

Binomial Expansion

For a binomial expansion of the form $(a + b)^n$, the following statements are true.

1) There are $n + 1$ terms.
2) The coefficients are the numbers from the *nth* row of Pascal's triangle.
3) The exponent of a is n in the first term, and the exponent decreases by 1 in each successive term.
4) The exponent of b is 0 in the first term, and the exponent increases by 1 in each successive term.
5) The sum of the exponents in any term is n.

Example 4) Using Pascal's Triangle to Expand Binomial Expressions
Expand each expression.

a) $(y - 3)^4$

b) $(4z + 5)^3$

c) $(3x - 2y)^5$

Example 5) DO #52, 58-69 ALL, p. 419-420

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Binomial Expansion and Pascal's Triangle

Binomial Expansion		Pascal's Triangle (Coefficients)
$(a + b)^0 =$	1	1
$(a + b)^1 =$	$a + b$	1 1
$(a + b)^2 =$	$a^2 + 2ab + b^2$	1 2 1
$(a + b)^3 =$	$a^3b + 3a^2b + 3ab^2 + b^3$	1 3 3 1
$(a + b)^4 =$	$a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$	1 4 6 4 1
$(a + b)^5 =$	$a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$	1 5 10 10 5 1