9.3: Find Special Products of Polynomials

Goals: *Identify a pattern and use when squaring a binomial sum
*Identify a pattern and use when squaring a binomial difference
*Identify a pattern and use when multiplying a binomial sum and difference

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Special Products Formulas

1. $(a + b)^2 = a^2 + 2ab + b^2$

2. $(a - b)^2 = a^2 - 2ab + b^2$

3. $(a + b)(a - b) = a^2 - b^2$

Foil then try to find the pattern and come up with a formula for $(a + b)^2$.

Ex: $(x + y)^2$

$x^2 + 2xy + y^2$

Ex: $(3 + x)^2$

$9 + 6x + x^2$

Ex: $(2x + y)^2$

$4x^2 + 4xy + y^2$

Multiply each polynomial by applying the special products formula:

Ex: $(x + 3)^2$

$x^2 + 6x + 9$

Ex: $(2x + 1)^2$

$4x^2 + 4x + 1$

Ex: $(3m + n)^2$

$9m^2 + 6mn + n^2$

Ex: $(x + 5)^2$

$x^2 + 10x + 25$

Ex: $(3x + 4)^2$

$9x^2 + 24x + 16$

Ex: $(2x + 5)^2$

$4x^2 + 20x + 25$

Foil. Then try and find a pattern to come up with a formula for $(a - b)^2$.

Ex: $(x - y)^2$

$x^2 - 2xy + y^2$

Ex: $(2x - y)^2$

$4x^2 - 4xy + y^2$

Ex: $(x - 3)^2$

$x^2 - 6x + 9$

Multiply each polynomial by applying the special products formula:

Ex: $(4x - y)^2$

$16x^2 - 8xy + y^2$

Ex: $(2x - 3)^2$

$4x^2 - 12x + 9$

Ex: $(5x - 2y)^2$

$25x^2 - 20xy + 4y^2$

Ex: $(3x - 4y)^2$

$9x^2 - 24xy + 16y^2$

Foil. Then try and find a pattern to come up with a formula for $(a + b)(a - b)$

Ex: $(x + y)(x - y)$

$x^2 - y^2$

Ex: $(2x - 3y)(2x + 3y)$

$4x^2 - 9y^2$

Ex: $(c + 3d)(c - 3d)$

$c^2 - 9d^2$

Multiply each polynomial by applying the special products formula:

Ex: $(t + 5)(t - 5)$

$t^2 - 25$

Ex: $(3x + y)(3x - y)$

$9x^2 - y^2$

Ex: $(x + 10)(x - 10)$

$x^2 - 100$

Ex: $(2x + 1)(2x - 1)$

$4x^2 - 1$

Ex: $(r + 3)(r - 3)$

$r^2 - 9$

Ex: $(x + 3y)(x - 3y)$

$x^2 - 9y^2$

Ex: $(4x + y)(4x - y)$

$16x^2 - y^2$