

Section 9.2 Multiplication of Polynomials

Multiplying Polynomials by using the Distributive Property

Example 1: Find the product.

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

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

$$10x^2 + 15x - 25$$

b. $2x(4x^3 + 2x + 4)$

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

$$8x^4 + 4x^2 + 8x$$

Multiplying Polynomials by using the Box Method

Example 2: Find the product.

a. $(x^2 + 4)(3x^3 - 2)$

	$3x^3$	-2
x^2	$3x^5$	$-2x^2$
4	$12x^3$	-8

$$3x^5 + 12x^3 - 2x^2 - 8$$

b. $(a^2 - 6a - 3)(2a - 5)$

	$2a$	-5
a^2	$2a^3$	$-5a^2$
$-6a$	$-12a^2$	$30a$
-3	$-6a$	$+15$

combine like terms

$$2a^3 - 17a^2 + 24a + 15$$

Multiplying Polynomials by using the FOIL METHOD

F (first) O (outside) I (inside) L (last)

Example 3: Find the product.

a. $(x + 3)(5 + x)$

F	O	I	L
$x(5)$	$x(x)$	$3(5)$	$3(x)$

$$5x + x^2 + 15 + 3x$$

$$x^2 + 8x + 15$$

b. $(2x - 6)(x + 4)$

F	O	I	L
$2x(x)$	$2x(4)$	$-6(x)$	$-6(4)$

$$2x^2 + 8x - 6x - 24$$

$$2x^2 + 2x - 24$$

c. $(5x^2 + 6)(2x^2 - 6)$

F	O	I	L
$5x^2(2x^2)$	$5x^2(-6)$	$6(2x^2)$	$6(-6)$

$$10x^4 - 30x^2 + 12x^2 - 36$$

$$10x^4 - 18x^2 - 36$$

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Checkpoint: Find the product of each of these polynomials.

1. $3x^3(2x^3 - x^2 - 7x - 3)$

$$6x^6 - 3x^5 - 21x^4 - 9x^3$$

2. $(3b^2 - 2b + 5)(5b - 6)$

	$5b$	-6
$3b^2$	$15b^3$	$-18b^2$
$-2b$	$-10b^2$	$12b$
5	$25b$	-30

$$15b^3 - 28b^2 + 37b - 30$$

3. $(2c + 7)(c - 9)$

$$2c^2 + 7c - 18c - 63$$

$2c^2 - 11c - 63$