Study Guide

Multiplying Polynomials

The following example shows how the distributive property can
be used to multiply any two polynomials.

Example 1: Find $(2x - 6)(3x + 1)$.

$$\begin{array}{c} \ \ F \quad\quad O \quad\quad\ I \quad\quad\quad L \\ (2x - 6)(3x + 1) = 2x \cdot 3x + 2x \cdot 1 + (-6) \cdot 3x + (-6) \cdot 1 \\ = 6x^2 + 2x - 18x - 6 \\ = 6x^2 - 16x - 6 \end{array}$$

You can also multiply polynomials vertically.

Example 2: Find $(3x^2 - x + 1)(5x + 2)$.

$$\begin{array}{r} 3x^2 - \ \ x + 1 \\ \times \quad\quad 5x + 2 \\ \hline 6x^2 - 2x + 2 \\ 15x^3 - 5x^2 + 5x \quad\quad\quad \\ \hline 15x^3 + \ \ x^2 + 3x + 2 \end{array}$$

  Multiply $3x^2 - x + 1$ by 2.
  Multiply $3x^2 - x + 1$ by 5x.
  Combine like terms.

Find each product.

1. $(5t + 4)(2t - 6)$

2. $(5m - 3n)(4m - 2n)$

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

4. $(3x - 0.1)(x + 0.1)$

5. $(8x + 5)(8x - 5)$

6. $(x + 5)(x + 2)$

7. $(2x - 4)(2x + 5)$

8.
$$\begin{array}{r} y^2 - 5y + 3 \\ \times\ 2y^2 + 7y - 4 \end{array}$$

9.
$$\begin{array}{r} 3b^3 - 2b^2 + b \\ \times \quad\quad 2b - 3 \end{array}$$