2.2 Product of Binomials

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2.2 Product of Binomials

A. **DISTRIBUTIVE PROPERTY**:
   Multiply each term of the binomial by the monomial

Example 1: Expand each expression

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

$$2x^2(3x) - 2x^2(4)$$
$$= 6x^3 - 8x^2$$

b) $-4h^3(6 - 11h)$

$$-4h^3(6) - (-4h^3)(11h)$$
$$-24h^3 - (-44h^4)$$
$$= -24h^3 + 44h^4$$

B. **THE PRODUCT OF TWO BINOMIALS**:
   An application of the distributive law. Multiply each term of the first binomial by each term of the second binomial.

   Use the acronym **FOIL** to help with the distributive law.

   F — first terms
   O · Outside
   I — inside
   L — last

Example 2: Expand each expression and simplify

a) $(x - 4)(x + 2)$

$$= x(x) + x(2) + (-4)(x) + (-4)(2)$$
$$= x^2 + 2x - 4x - 8$$
$$= x^2 - 2x - 8$$

b) $(x + 5)(x - 3)$

$$x(x) + x(-3) + 5(x) + 5(-3)$$
$$x^2 - 3x + 5x - 15$$
$$x^2 + 2x - 15$$

c) $(3x + 2)(5x - 7)$ d) $(2x - 1)(4x + 3)$

$3x(5x) + 3x(-7) + 2(5x) + 2(-7)$

$15x^2 - 21x + 10x - 14$

$15x^2 - 11x - 14$

d) $(2x - 1)(4x + 3)$

$2x(4x) + 2x(3) + (-1)(4x) + (-1)(3)$

$8x^2 + 6x - 4x - 3$

$$\boxed{8x^2 + 2x - 3}$$

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