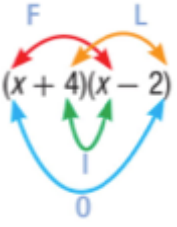
L8-3 Multiplying Polynomials

KeyConcept FOIL Method

Words To multiply two binomials, find the sum of the products of *F* the *First* terms, *O* the *Outer* terms, *I* the *Inner* terms, *L* and the *Last* terms.

Example



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

Product of First Terms: $(x)(x)$ + Product of Outer Terms: $(x)(-2)$ + Product of Inner Terms: $(4)(x)$ + Product of Last Terms: $(4)(-2)$

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

$= x^2 + 2x - 8$

$(y + 8)(y - 4)$

$(y \cdot y) + (-4 \cdot y) + (8 \cdot y) + (8 \cdot -4)$

F O I L

$y^2 - 4y + 8y - 32$

$y^2 + 4y - 32$

First
Outer
Inner
Last

$(2x + 1)(x + 6)$

FOIL

F O I L

$(2x \cdot x) + (2x \cdot 6) + (1 \cdot x) + (1 \cdot 6)$

$2x^2 + 12x + 1x + 6$

$2x^2 + 13x + 6$

$(5x - 4)(2x + 8)$

$10x^2 + 40x - 8x - 32$

$10x^2 + 32x - 32$

The Distributive Property

$(3z + 2)(4z^2 + 3z + 5)$

2 terms · 3 terms = 6 terms when unsimplified.

$(3z \cdot 4z^2) + (3z \cdot 3z) + (3z \cdot 5) +$
$(2 \cdot 4z^2) + (2 \cdot 3z) + (2 \cdot 5) =$

$12z^3 + 9z^2 + 15z + 8z^2 + 6z + 10 =$

$12z^3 + 17z^2 + 21z + 10$

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

KeyConcept Square of a Sum

Words The square of $a + b$ is the square of a plus twice the product of a and b plus the square of b.

Symbols $(a + b)^2 = (a + b)(a + b)$
$= a^2 + 2ab + b^2$

Example $(x + 4)^2 = (x + 4)(x + 4)$
$= x^2 + 8x + 16$

KeyConcept Square of a Difference

Words The square of $a - b$ is the square of a minus twice the product of a and b plus the square of b.

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

Example $(x - 3)^2 = (x - 3)(x - 3)$
$= x^2 - 6x + 9$

KeyConcept Product of a Sum and a Difference

Words The product of $a + b$ and $a - b$ is the square of a minus the square of b.

Symbols $(a + b)(a - b) = (a - b)(a + b)$
$= a^2 - b^2$

$(9d + 4)(9d - 4)$

$(7z + 2)^2$

$(3c - 4)^2$

$(3x + 2)^2$

$(2m - 3)^2$

$(3y + 2)(3y - 2)$

GEOMETRY The area of a rectangle is the measure of the base times the height. Write an expression for the area of the rectangle.