

Box Method - Multiplying Polynomials

Reminder: $x \cdot x = x^2$ $x \cdot x^2 = x^3$

$x^3 \cdot x^4 = x^7$

Ex. 1
(monomial)(binomial)

$7x^2(4x^5 - 2x^3)$
 $28x^7 - 14x^5$

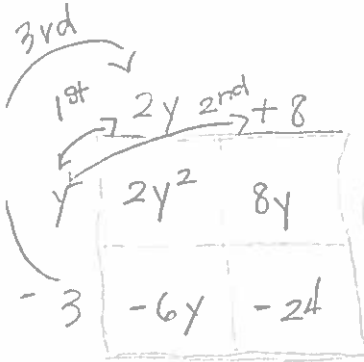
7th degree binomial

You Try
(monomial)(trinomial)

$5n(3n^3 - n^2 + 8)$
 $15n^4 - 5n^3 + 40n$

4th degree Trinomial

Ex. 2
(binomial)(binomial)
 $(2y + 8)(y - 3)$

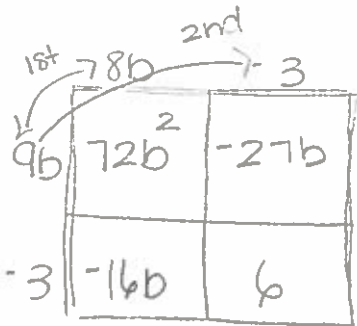


$2y^2 + 8y - 6y - 24$
 $2y^2 + 2y - 24$

quadratic trinomial

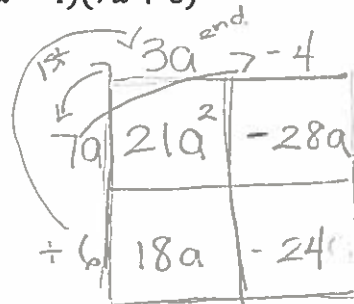
- Steps
- (1) Draw a box.
Put one binomial on top.
Put one binomial at the left.
 - (2) Multiply the sides.
Put the product on the inside.
 - (3) Identify like terms.
 - (4) Combine like terms.
Write the simplified polynomial.

Ex. 3
(binomial)(binomial)
 $(8b - 3)(9b - 2)$



$72b^2 - 27b - 16b + 6$
 $72b^2 - 43b + 6$

You Try
(binomial)(binomial)
 $(3a - 4)(7a + 6)$



$21a^2 - 28a + 18a - 24$
 $21a^2 - 10a - 24$

Ex. 4

(binomial)(trinomial)
 $(2x - 5)(x^2 - 5x + 4)$

	x^2	$-5x$	$+4$
$2x$	$2x^3$	$-10x^2$	$8x$
-5	$-5x^2$	$25x$	-20

$2x^3 - 15x^2 + 33x - 20$

You Try

(binomial)(trinomial)
 $(2x - 3)(x^2 - 4x + 7)$

	x^2	$-4x$	$+7$
$2x$	$2x^3$	$-8x^2$	$14x$
-3	$-3x^2$	$12x$	-21

$2x^3 - 11x^2 + 26x - 21$

Ex. 5 - Application

A square painting is surrounded by a frame. The outside edges of the frame are x inches in length and there is a 3-inch border between the painting and the frame. What is the area of the border?



Area = length \cdot width

Border = Whole - Painting
 $= x^2 - (x^2 - 12x + 36) = 12x - 36$
 $x^2 - x^2 + 12x - 36$

Whole = $x \cdot x$
 $= x^2$

Painting $(x - 6)(x - 6)$
 $x^2 - 6x - 6x + 36$
 $x^2 - 12x + 36$

You Try - Application

A square painting is surrounded by a frame. The outside edges of the frame are x inches in length and there is a 5-inch border between the painting and the frame. What is the area of the border?