Name: _____

Expanding Binomials

A binomial is a polynomial with <u>two</u> terms.
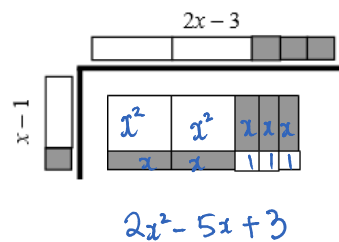
Binomials can be simplified using the following methods:

Expand $(2x-3)(x-1)$.

RULE

Every term in one binomial **MUST** be multiplied by every term in the other binomial.

1. **Algebra Tiles/Area Model**
   i.   draw a multiplication frame
   ii.   use algebra tiles to model each binomial
   iii. fill the rectangle using algebra tiles
   iv.   state the answer

$2x-3$

$x-1$

x^2	x^2	$x\,x\,x$
x	x	

$2x^2 - 5x + 3$

2. **Chart**
   i.   draw a chart
   ii.   place each term from one binomial at the top of each column and each term from the other binomial at the beginning of each row
   iii. multiply columns and rows
   iv.   state the answer

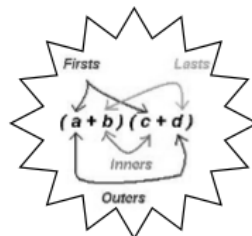|	$2x$	-3
x	$2x^2$	$-3x$
-1	$-2x$	$+3$

$2x^2 - 5x + 3$

3. **Expand Using The Distributive Property**

$(2x-3)(x-1) = 2x(x-1) - 3(x-1)$

$= 2x^2 - 2x - 3x + 3$

$= 2x^2 - 5x + 3$

You can tell by his expression that Craig is just crazy about mathematics!
That's true, he tells me he's developing a quick method of expanding algebra!

4. **Multiplication Pattern: FOIL**

$(2x-3)(x-1) =$

Firsts   Lasts

$(a+b)(c+d)$

Inners

Outers

F   O   I   L
$2x^2 - 2x - 3x + 3$

$= 2x^2 - 5x + 3$

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Example 1

Expand each of the following.

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

$= 5x^2 - 15x - 2x + 6$

$= 5x^2 - 17x + 6$

b. $(2x+1)(3x-2)$

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

$= 6x^2 - 1x - 2$

c. $(6x+1)^2$

$= (6x+1)(6x+1)$

$= 36x^2 + 6x + 6x + 1$

$= 36x^2 + 12x + 1$

d. $(x-1)^2$

$= (x-1)(x-1)$

$= x^2 - 1x - 1x + 1$

$= x^2 - 2x + 1$