

Multiplying Binomials - Distributive Property

Strategy	Example	How You Would Explain																		
FOIL	<p style="text-align: center;">Outside</p> <p style="text-align: center;">First</p> $(x+9)(x+1)$ <p style="text-align: center;">Last</p> <p>First: $x(x) = x^2$ Outside: $x(1) = x$ Last: $9(1) = 9$</p> <p style="text-align: center;">Like Terms</p> $x^2 + x + 9x + 9$ $x^2 + x + 9x + 9$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $x^2 + 10x + 9$ </div>	<p>What steps would you tell someone to take?</p> <ul style="list-style-type: none"> • multiply out of the number starting from First, outside, inside, Last. • combine the like terms <p>Apply those steps to this example.</p> $4x^2 + 20x - 1x - 5$ $4x^2 + 19x - 5$ $(4x - 1)(x + 5)$																		
Box Method	$(x-5)(3x-9)$ <table style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">x</td> <td style="padding: 5px; text-align: center;">-5</td> </tr> <tr> <td style="padding: 5px; text-align: center;">3x</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$3x^2$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$-15x$</td> </tr> <tr> <td style="padding: 5px; text-align: center;">-9</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$-9x$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$+45$</td> </tr> </table> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $3x^2 - 24x + 45$ </div>		x	-5	3x	$3x^2$	$-15x$	-9	$-9x$	$+45$	<p>What steps would you tell someone to take?</p> <ul style="list-style-type: none"> * create a box and plug in #'s * multiply numbers on top by #'s on side to get inside * combine like terms <p>Apply those steps to this example.</p> $(4x - 1)(x + 5)$ <table style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">4x</td> <td style="padding: 5px; text-align: center;">-1</td> </tr> <tr> <td style="padding: 5px; text-align: center;">4x</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$4x^2$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$-1x$</td> </tr> <tr> <td style="padding: 5px; text-align: center;">5</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$20x$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">-5</td> </tr> </table> $4x^2 + 20x - 1x - 5$ $4x^2 + 19x - 5$		4x	-1	4x	$4x^2$	$-1x$	5	$20x$	-5
	x	-5																		
3x	$3x^2$	$-15x$																		
-9	$-9x$	$+45$																		
	4x	-1																		
4x	$4x^2$	$-1x$																		
5	$20x$	-5																		
"Rockets"	$(2x - 3)(x + 4)$ <p style="text-align: center;"> $2x^2 + 8x - 3x - 12$ </p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $2x^2 + 5x - 12$ </div>	<p>What steps would you tell someone to take?</p> <ul style="list-style-type: none"> • shoot a rocket from first term to both terms in next binomial • shoot a rocket from next term to both terms in next b.n. • multiply rockets <p>Apply those steps to this example.</p> $(4x - 1)(x + 5)$ $4x^2 + 20x - 1x - 5$ $4x^2 + 19x - 5$																		

Multiplying Binomials by Trinomials and More!

- Box Method & "Rockets" work best when one of your factors has more than two terms.

Ex. $(3x - 1)(2x^2 + 5x - 4)$

$$(3x-1)(2x^2+5x-4)$$

$$6x^3 + 15x^2 - 12x - 2x^2 - 5x + 4$$

$$6x^3 + 13x^2 - 17x + 4$$

	$2x^2$	$5x$	-4
$3x$	$6x^3$	$15x^2$	$-12x$
-1	$-2x^2$	$-5x$	4

$$6x^3 + 13x^2 - 17x + 4$$

You Try $(2x + 4)(3x^2 - x + 6)$

$$(2x+4)(3x^2-x+6)$$

	$2x$	4
$3x^2$	$6x^3$	$12x^2$
$-x$	$-2x^2$	$-4x$
6	$12x$	24

$$6x^3 + 10x^2 + 8x + 24$$

Good Luck! $(3x^2 + 2x - 1)(5x^2 - 4x + 2)$

$$(3x^2+2x-1)(5x^2-4x+2)$$

	$5x^2$	$2x$	-1
$3x^2$	$15x^4$	$10x^3$	$-5x^2$
$-4x$	$-12x^3$	$-8x^2$	$4x$
2	$6x^2$	$4x$	-2

$$15x^4 - 2x^3 - 5x^2 + 8x - 2$$