

Name: _____

Multiplying Binomials (Part 2)

Multiply and simplify. Look for patterns

$1(x - r_1)(x - r_2)$	EXAMPLE $(x + 1)(x - 1)$	1. $(x + 2)(x - 2)$	2. $(x + 3)(x - 3)$
Distribute 1 st group	$x(x + 1) - 1(x + 1)$		
Distribute into each group & simplify to	$x(x) + x(1) - 1(x) - 1(1)$ $x^2 + 1x - 1x - 1$		
$1x^2 + b_1x + b_2x + c$ Simplify to	$x^2 + 0x - 1$ $x^2 - 1$		
$1x^2 + bx + c$			
Answer	$(x + 1)(x - 1) = \boxed{x^2 - 1}$	$(x + 2)(x - 2) =$	$(x + 3)(x - 3) =$

$1(x - r_1)(x - r_2)$	3. $(x + 4)(x - 4)$	4. $(x + 5)(x - 5)$	5. $(x + 6)(x - 6)$
Distribute 1 st group			
Distribute into each group & simplify to			
$1x^2 + b_1x + b_2x + c$ Simplify to			
$1x^2 + bx + c$			
Answer	$(x + 4)(x - 4) =$	$(x + 5)(x - 5) =$	$(x + 6)(x - 6) =$

$1(x - r_1)(x - r_2)$	6. $(2x + 3)(2x - 3)$	7. $(3x + 1)(3x - 1)$	8. $(4x + 2)(4x - 2)$
Distribute 1 st group			
Distribute into each group & simplify to			
$1x^2 + b_1x + b_2x + c$ Simplify to			
$1x^2 + bx + c$			
Answer	$(2x + 3)(2x - 3) =$	$(3x + 1)(3x - 1) =$	$(4x + 2)(4x - 2) =$

What do you notice about how these binomials are setup and about what happens when they are multiplied?

Rule: $(a + b)(a - b) =$

Now that we have established a pattern, let's use it to skip from the problem to the solution.

9. $(x + 7)(x - 7) =$	10. $(3x + 2)(3x - 2) =$	11. $(4x + 3)(4x - 3) =$
12. $(2x + 4)(2x - 4) =$	13. $(x + 8)(x - 8) =$	14. $(x + 10)(x - 10) =$
15. $(x + 9)(x - 9) =$	16. $(3x + 4)(3x - 4) =$	17. $(2x + 1)(2x - 1) =$

We can also use this pattern to go from the product (multiplied answer) to the factors (binomial parts).

Backwards Rule:

$$a - b = (\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) \quad \text{or} \quad a^2 - b^2 = (a + b)(a - b)$$

18. $x^2 - 49 =$	19. $9x^2 - 4 =$	20. $16x^2 - 9 =$
21. $4x^2 - 16 =$	22. $x^2 - 64 =$	23. $x^2 - 100 =$
24. $x^2 - 81 =$	25. $9x^2 - 16 =$	17. $4x^2 - 1 =$