4.7 Mulitplying & Factoring Perfect Square Trinomials

A. Multiplying a Squared Binomial (perfect square)

Look for patterns!!!

1. $(x+5)(x+5)$

$= x^2 + 10x + 25$

	x	5
x	x^2	$5x$
5	$5x$	25

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

$= x^2 - 3x - 3x + 9$

$= x^2 - 6x + 9$

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

$= 4x^2 + 4x + 1$

	$2x$	1
$2x$	$4x^2$	$2x$
1	$2x$	1

Look for patterns!!!

4. $(2x+3)^2 = (2x+3)(2x+3)$

$= 4x^2 + 6x + 6x + 9$

$= 4x^2 + 12x + 9$

5. $(4x-1)^2$

$= 16x^2 - 8x + 1$

	$4x$	-1
$4x$	$16x^2$	$-4x$
-1	$-4x$	1

6. $(3x+5)^2$

$= 9x^2 + 30x + 25$

7. $(2x-3y)^2$

$2x(-3y) \times 2$

$= 4x^2 - 12xy + 9y^2$

8. $(2x+3y)^2$

$= 4x^2 + 12xy + 9y^2$

Look for patterns!!!

9. $(5x^2 - 2z^3)^2$

$= 25x^4 - 20x^2z^3 + 4z^6$

10. $(x + 4x^2y)^2$

$= x^2 + 8x^3y + 16x^4y^2$

B. Factoring a Perfect Square Trinomial

perfect square → $\square^2 + 2\square\{\ \}+\{\ \}^2$ ← perfect square

square root of first term

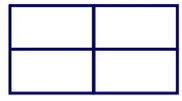
square root of second term

$\sqrt{x^2} = x$ $\sqrt{4} = 2$

1. $x^2 - 4x + 4$

$= (x - 2)^2$

$(x)(-2)(2) = -4x$ ✓ yes



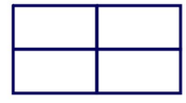
$\sqrt{4x^2}$ $\sqrt{1}$

2. $x^2 + 14x + 49$

$= (x + 7)^2$

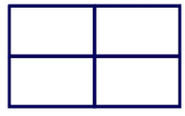
Look for patterns!!!

$(x)(7)(2) = 14x$ ✓ yes



3. $4x^2 - 4x + 1$

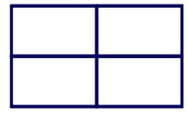
$= (2x - 1)^2$



Look for patterns!!!

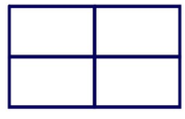
4. $25x^2 + 20x + 4$

$= (5x + 2)^2$



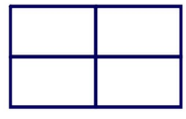
5. $9x^2 + 24x + 16$

$= (3x + 4)^2$



6. $4x^2 - 20x + 25$

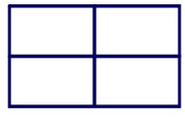
$= (2x - 5)^2$



7. $9x^2 - 42xy + 49y^2$

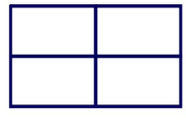
$= (3x - 7y)^2$

Look for patterns!!!



8. $x^2y^2 + 6xyz + 9z^2$

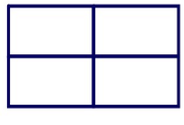
$= (xy + 3z)^2$



9. $16x^4 - 8x^2y + y^2$

$= (4x^2 - y)^2$

Look for patterns!!!



10. $4a^6 + 12a^3b + 9b^2$

$= (2a^3 + 3b)^2$