AChor/MFM2P **Name: _____**
Date: _____

Special Trinomial Product: Perfect Square of a Binomial

Special Product Investigation: $(a+b)^2$ **"Square of a Sum"**

Square of Binomial	x^2-Term	x- Term	Constant
$(x+4)^2 = (x+4)(x+4)$	x^2	$8x$	16
$= x^2+4x+4x+16$	$(x)(x)$	$(2)(x)(4)$	$(4)(4)$
$= x^2+8x+16$	x^2	$(2)(x)(4)$	16
$(x+7)^2 =$			
$(2x+1)^2 =$			
$(3x+2)^2 =$			

Conclusion:

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

Practice: Expand and simplify the following expressions with the Special Product Rules.

1. (a) $(x+3)^2$ (b) $(x+6)^2$

(c) $(2n+4)^2$ (d) $(3p+q)^2$

Answers: 1. (a) $a=x, b=3, x^2+(2)(x)(3)+3^2=x^2+6x+9$, (b) $a=x, b=6, x^2+(2)(x)(6)+6^2=x^2+12x+36$,
(c) $a=2n, b=4, (2n)^2+(2)(2n)(4)+4^2=4n^2+16n+16$
(d) $a=3p, b=q, (3p)^2+(2)(3p)(q)+q^2=9p^2+6pq+p^2$

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Special Product Investigation: $(a-b)^2$ **"Square of a Difference"**

Square of Binomial	x^2-Term	x- Term	Constant
$(x-4)^2 = (x-4)(x-4)$	x^2	$-8x$	16
$= x^2-4x-4x+16$	$(x)(x)$	$(2)(x)(-4)$	$(-4)(-4)$
$= x^2-8x+16$	x^2	$-(2)(x)(4)$	16
$(x-7)^2 =$			
$(2x-1)^2 =$			
$(3x-2)^2 =$			

Conclusion:

$$(a-b)^2 = a^2-2ab+b^2$$

Practice: Expand and simplify the following expressions with the Special Product Rules.

2. (a) $(y-5)^2$ (b) $(x-9)^2$

(c) $(3m-7)^2$ (d) $(x-4y)^2$

Answers: 2. (a) $a=y, b=5, y^2-(2)(y)(5)+5^2=y^2-10y+25$, (b) $a=x, b=9, x^2-(2)(x)(9)+9^2=x^2-18x+81$,
(c) $a=3m, b=7, (3m)^2-(2)(3m)(7)+7^2=9m^2-42m+49$
(d) $a=x, b=4y, x^2-(2)(x)(4y)+(4y)^2=x^2-8xy+16y^2$

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Special Products Investigation: $(a+b)(a-b)$ **"Product of a Sum and a Difference"**

Square of Binomial	x^2-Term	x- Term	Constant
$(x+4)(x-4)$	x^2	0	-16
$= x^2-4x+4x-16$	$(x)(x)$	$-4x+4x$	$(4)(-4)$
$= x^2-16$	x^2	0	-16
$(x+7)(x-7)$			
$(2x+1)(2x-1)$			
$(3x+2)(3x-2)$			

Conclusion:

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

Practice: Expand and simplify the following expressions with the Special Product Rules.

3. (a) $(4+d)(4-d)$ (c) $(x+8)(x-8)$

(c) $(3b-7)(3b+7)$ (d) $(2m-n)(2m+n)$

Answers: 3. (a) $a=4, b=d, 4^2-d^2=16-d^2$, (b) $a=x, b=8, x^2-8^2=x^2-64$,
(c) $a=3b, b=7, (3b)^2-7^2=9b^2-49$, (d) $a=2m, b=n, (2m)^2-n^2=4m^2-n^2$