Lesson Title 4.2 Adding, Subtracting, & Multiplying Polynomial Functions Notes **ALG 2** **Date** _____

Adding & Subtracting Polynomials

Combining like terms (CLT). The terms must have the same variable and same exponent to combine the coefficients. When you are done, write your answer in standard form (decreasing by exponent.)

TASK 1: Add & Subtract the Polynomials

1) $3x^3 + 2x^2 - x - 7 + (x^3 - 10x^2 + 8)$

$4x^3 - 8x^2 - x + 1$

2) $(9y^3 + 3y^2 - 2y + 1) + (-5y^2 + y - 4)$

$9y^3 - 2y^2 - y - 3$

3) $2x^3 + 6x^2 - x + 1 - (8x^3 - 3x^2 - 2x + 9)$

$2x^3 + 6x^2 - x + 1 - 8x^3 + 3x^2 + 2x - 9$

$-6x^3 + 9x^2 + x - 8$

4) $(3z^2 + z - 4) - (2z^2 + 3z)$

$3z^2 + z - 4 - 2z^2 - 3z$

$z^2 - 2z - 4$

Special Product Patterns

Sum and Difference	Example
$(a + b)(a - b) = a^2 - b^2$	$(x + 3)(x - 3) = x^2 - 9$

Square of a Binomial	Example
$(a + b)^2 = a^2 + 2ab + b^2$	$(y + 4)^2 = y^2 + 8y + 16$
$(a - b)^2 = a^2 - 2ab + b^2$	$(2t - 5)^2 = 4t^2 - 20t + 25$

Cube of a Binomial	Example
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$	$(z + 3)^3 = z^3 + 9z^2 + 27z + 27$
$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$	$(m - 2)^3 = m^3 - 6m^2 + 12m - 8$

TASK 2: Multiplying Polynomials

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

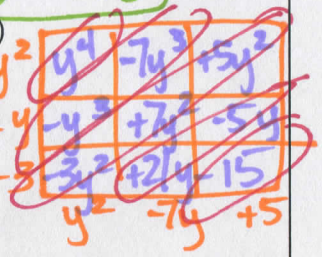
$(a^2 + 2ab + 2ab + 4b^2)(a + 2b)$

$a^3 + 2a^2b + 4a^2b + 8ab^2 + 4ab^2 + 8b^3$

$a^3 + 6a^2b + 12ab^2 + 8b^3$

b) $(y^2 - 7y + 5)(y^2 - y - 3)$

$y^4 - 8y^3 + 9y^2 + 16y - 15$



c) $(a - 3)(2 - 5a + a^2)$

$2a - 5a^2 + a^3$

$+ \quad -6 + 15a - 3a^2$

$-6 + 17a - 8a^2 + a^3$

$a^3 - 8a^2 + 17a - 6$

Binomial Expansion		Pascal's Triangle (Coefficients)
$(a+b)^0 =$	1	1
$(a+b)^1 =$	$a+b$	1 1
$(a+b)^2 =$	$a^2+2ab+b^2$	1 2 1
$(a+b)^3 =$	$a^3+3a^2b+3ab^2+b^3$	1 3 3 1
$(a+b)^4 =$	$a^4+4a^3b+6a^2b^2+4ab^3+b^4$	1 4 6 4 1
$(a+b)^5 =$	$a^5+5a^4b+10a^3b^2+10a^2b^3+5ab^4+b^5$	1 5 10 10 5 1

a ↓ 0

b ↑ 0

1
1 1
1 2 1
1 3 3 1

TASK 3: Pascal's Triangle

a) $(k-5)^3$

a = k b = -5

$1k^3(-5)^0 + 3k^2(-5)^1 + 3k^1(-5)^2 + 1k^0(-5)^3$

$(-5)(-5)(-5)$

$+3k(25)$

$k^3 - 15k^2 + 75k - 125$

b) $(6m-8)^3$

a = 6m b = -8

$1(6m)^3(-8)^0 + 3(6m)^2(-8)^1 + 3(6m)^1(-8)^2 + 1(6m)^0(-8)^3$

$(6m)(6m)(6m)$ $(6m)(6m)$ $(-8)(-8)$ $(-8)(-8)(-8)$

$3(-8)$

$216m^3 - 864m^2 + 1152m - 512$

1
1 1
1 2 1
1 3 3 1

Notes to yourself about what you struggled with so you don't make the same mistake again!!!

- ones on both sides like an upside down V
- "0" is the first 1
- a ↓ to "0" & b ↑ from "0"
- FOIL, Punnett Square into standard form

Still need help with: