Name: Key Algebra II Period: _____

Operations with Polynomials

Adding and Subtracting Polynomials

1.) $(3x^2 + 11x + 4) + (-5x + x^2 - 13)$

$3x^2+11x+4-5x+x^2-13$

$3x^2+x^2+11x-5x+4-13$

$4x^2+6x-9$

2.) $(9n^3 - 4n^2 + 2n - 10) + (-2n^2 + n - 7)$

$9n^3-4n^2+2n-10-2n^2+n-7$

$9n^3-4n^2-2n^2+2n+n-10-7$

$9n^3-6n^2+3n-17$

3.) $(5k^3 - 2k^2 + 2k) - (2k^2 + 2k + 17)$

$5k^3-2k^2+2k-2k^2-2k-17$

$5k^3-2k^2-2k^2+2k-2k-17$

$5k^3-4k^2-17$

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

$y+4y^2-3-1-2y^2+5y+y^3$

$y^3+4y^2-2y^2+y+5y-3-1$

y^3+2y^2+6y-4

Multiplying Polynomials

1.) Distribute or FOIL.
2.) Combine like terms!
3.) Write your answer in **standard form**.

5.) $(2a - b)(-4a + 3b)$ FOIL

$-8a^2+6ab+4ab-3b^2$

$-8a^2+10ab-3b^2$

6.) $(w - 7)(w^2 + 2w + 1)$

	w^2	$2w$	1
w	w^3	$2w^2$	w
-7	$-7w^2$	$-14w$	-7

$w^3-5w^2-13w-7$

7.) $(x + 3)(x^2 - 5x + 8)$

	x^2	$-5x$	8
x	x^3	$-5x^2$	$8x$
3	$3x^2$	$-15x$	24

$x^3-2x^2-7x+24$

8.) $(a + 5)(a - 2)(a + 8)$ FOIL, then BOX

$a^2-2a+5a-10$

$(a^2+3a-10)(a+8)$

	a	8
a^2	a^3	$8a^2$
$3a$	$3a^2$	$24a$
-10	$-10a$	-80

$a^3+11a^2+14a-80$

9.) $(3x - 6)(x + 4)(2x - 1)$ FOIL, then BOX

$(3x^2+12x-6x-24)(2x-1)$

$(3x^2+6x-24)(2x-1)$

	$2x$	-1
$3x^2$	$6x^3$	$-3x^2$
$6x$	$12x^2$	$-6x$
-24	$-48x$	24

$6x^3+9x^2-54x+24$

10.) $(c^2 + 4c + 6)(2c^2 - 3c + 5)$

	$2c^2$	$-3c$	5
c^2	$2c^4$	$-3c^3$	$5c^2$
$4c$	$8c^3$	$-12c^2$	$20c$
6	$12c^2$	$-18c$	30

$2c^4+5c^3+5c^2+2c+30$

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11.) $(3m^2 - 4m + 1)(2m^2 + 5m - 9)$

	$2m^2$	$5m$	-9
$3m^2$	$6m^4$	$15m^3$	$-27m^2$
$-4m$	$-8m^3$	$-20m^2$	$36m$
1	$2m^2$	$5m$	-9

$6m^4 + 7m^3 - 45m^2 + 41m - 9$

Dividing Polynomials (by a monomial)

1.) **DIVIDE** each term in the numerator by the monomial in the denominator.

2.) Write your answer in **standard form**. Rewrite all terms with negative exponents.

12.) $\frac{9m^3 - 24m^2}{3m}$

$\frac{9m^3}{3m} - \frac{24m^2}{3m}$

$= 3m^2 - 8m$

13.) $\frac{20x^3 - 4x^2 - 8x}{4x}$

$\frac{20x^3}{4x} - \frac{4x^2}{4x} - \frac{8x}{4x}$

$5x^2 - x - 2$

14.) $(14a^4b^3 - 20a^2b^2 + 2ab) \div (2ab)$

$\frac{14a^4b^3 - 20a^2b^2 + 2ab}{2ab}$

$\frac{14a^4b^3}{2ab} - \frac{20a^2b^2}{2ab} + \frac{2ab}{2ab}$

$7a^3b^2 - 10ab + 1$

15.) $(30c^8d^3 - 36c^6d^2 + 6c^3d) \div (12c^2d)$

$\frac{30c^8d^3 - 36c^6d^2 + 6c^3d}{12c^2d}$

$\frac{30c^8d^3}{12c^2d} - \frac{36c^6d^2}{12c^2d} + \frac{6c^3d}{12c^2d}$

$\frac{5}{2}c^6d^2 - 3c^4d + \frac{1}{2}c$

16.) $\frac{30x^3 - 12x^2 + 9x}{3x^2}$

$\frac{30x^3}{3x^2} - \frac{12x^2}{3x^2} + \frac{9x}{3x^2}$

$10x - 4 + 3x^{-1}$

$\hookrightarrow 10x - 4 + \frac{3}{x}$

17.) $\frac{40m^3n^4 - 24m^2n^7}{8m^2n^5}$

$\frac{40m^3n^4}{8m^2n^5} - \frac{24m^2n^7}{8m^2n^5}$

$5mn^{-1} - 3m^0n^2$

$\hookrightarrow \frac{5m}{n} - 3n^2$