Name:_____

U3:L4 Multiplication with Polynomials

To multiply polynomials, you **do not** need to combine like terms

To multiply polynomials, multiply coefficients separately from variables.

Variable multiplication does not need to be separated by degree.

Multiplying Monomials and Constants

$a^m \times a^n = a^{m+n}$

Examples:

$1ab^4c \times 7$

coefficients $1 \times 7 = 7$

variables ab^4c

$7ab^4c$

$(4x^2)(-3x)$

C: $(4) \times (-3) = -12$

V: $(x^2)(x^1) = x^{2+1} = x^3$

$-12x^3$

$(-2w^2y)(5wy)$

C: $(-2)(5) = -10$

V: $(w^2y^1)(wy^1) = w^2 \times y^1 \times w^1 \times y^1$

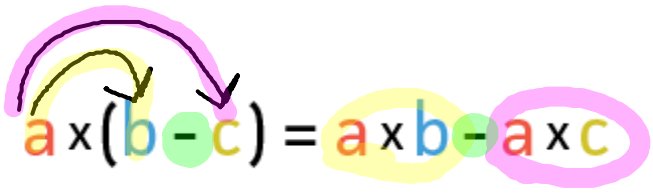
$= w^2 \times w^1 \times y^1 \times y^1$

$= w^{2+1} y^{1+1} = w^3y^2$

$-10w^3y^2$

Multiplying Monomials and Constants by Polynomials

This process requires us to use the distributive property



Expand and solve:

$2(3x-4)$

$2\times 3x - 2\times 4$

$6x - 8$

$2x(-3x-5) = (2x)(-3x-5)$

$(2x)\cdot(-3x) - (2x)(5)$

$-6x^2 - 10x$

$-3p^2(3-5p)$

$(-3p^2)(3-5p)$

$(-3p^2)\times(3) - (-3p^2)\times(5p)$

$(-3)(3)$ ✓ p^2 → $-9p^2$

$(-3)(5) = -15$ ✓ $p^2 \times p^1 = p^{2+1} = p^3$ → $-15p^3$

$-9p^2 - (-15p^3) = -9p^2 + 15p^3$

$\left(\frac{2}{3}p^3\right) \times \left(\frac{1}{3}p^4\right)$

C: $\frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$

V: $p^3 \times p^4 = p^{3+4} = p^7$

$\frac{2}{9}p^7$

The BOX Method

$2a(a^6 - a^3)$

	a^6	$-a^3$
$2a$	$2a^7$	$-2a^4$

$2a^7 - 2a^4$

CHALENGE Q!!!

$(x^2 + 3x + 4)(x^3 + 6x^2 + 2x)$

	x^3	$6x^2$	$2x$
x^2	x^5	$6x^4$	$2x^3$
$3x$	$3x^4$	$18x^3$	$6x^2$
4	$4x^3$	$24x^2$	$8x$

$x^5 + 9x^4 + 24x^3 + 30x^2 + 8x$