

## Unit 6.3 – Multiplying Polynomials

### Multiplying a Monomial: Using the Distributive Property

- Use the Distributive Property when multiplying a monomial to a polynomial.
- Remember to ADD the exponents when multiplying exponents with the SAME BASE.
- Make sure answer is completely SIMPLIFIED and polynomial is in STANDARD FORM.  
(NO LIKE TERMS) (exponents decrease L → R)

#### Example 1: Completely simplify.

a.)  $2x(5x^2 + x - 6)$   
 $10x^{1+2} + 2x^{1+1} - 12x$   
 $10x^3 + 2x^2 - 12x$

b.)  $-3y^2(3y^4 - 5 + 4y^2 - 2y^3)$   
 $-9y^{2+4} + 15y^2 - 12y^{2+2} + 6y^5$   
 $-9y^6 + 15y^2 - 12y^4 + 6y^5$

c.)  $4a^2b^3(2a^3b - 3ab^2)$   
 $8a^{2+3}b^{3+1} - 12a^2b^{3+2}$   
 $8a^5b^4 - 12a^2b^5$

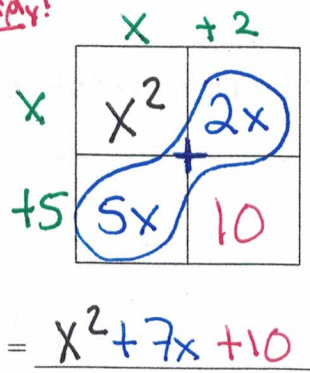
d.)  $6x(x+5) + 2(4-x) - x^2(6-5x)$   
 $6x^2 + 30x + 8 - 2x - 6x^2 + 5x^3$   
 $5x^3 + 6x^2 - 6x^2 + 30x - 2x + 8$   
 $5x^3 + 28x + 8$

e.)  $d^2(3d^3 + 2d - 4) - d(6d^2 + 5 - 3d)$   
 $3d^5 + 2d^3 - 4d^2 - 6d^3 - 5d + 3d^2$   
 $3d^5 - 2d^3 - 6d^3 - 4d^2 + 3d^2 - 5d$   
 $3d^5 - 4d^3 - d^2 - 5d$

**\*PUT IN STANDARD FORM\***

### Multiplying a Binomial to a Binomial: Using the BOX Method

- When multiplying a BINOMIAL to a BINOMIAL Ex:  $(x+2)(x+5) \rightarrow$  *There is not + or - here; multiply!*
- Make a square and cut it into 4 boxes
- Place the terms of the 1<sup>st</sup> term on top of the square
- Place the terms of the 2<sup>nd</sup> term to the left of the square
- Multiply each term from both binomials by lining up row by column then combine like terms by referring to the box's diagonal.



#### Example 2: Multiply each binomial using the box method.

a.)  $(x-6)(x+1)$

	$x$	$-6$
$x$	$x^2$	$-6x$
$+1$	$1x$	$-6$

$= x^2 - 5x - 6$

b.)  $(2w+3)(w+4)$

	$2w$	$+3$
$w$	$2w^2$	$3w$
$+4$	$8w$	$12$

$= 2w^2 + 11w + 12$

c.)  $(9a-8b)(7a-2b)$

	$9a$	$-8b$
$7a$	$63a^2$	$-56ab$
$-2b$	$-18ab$	$16b^2$

$= 63a^2 - 74ab + 16b^2$