

Name:

Date:

Topic/Objective: Multiply Polynomials

Class/Period:

## Using the BOX METHOD

Questions/Main Ideas:

Notes:

SWBAT: Multiply polynomials using the box method.

Remember FOIL:

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

$$3x^2 + 2x - 12x - 8$$

$$3x^2 - 10x - 8$$

Now let's try the box method:

$$\begin{array}{r} x - 4 \\ 3x \begin{array}{|c|c|} \hline 3x^2 & -12x \\ \hline 2x & -8 \\ \hline \end{array} \end{array}$$

$$3x^2 - 12x + 2x - 8$$

$$3x^2 - 10x - 8$$

Examples:

$$(x-2)(-x^2+3x+5)$$

$$\begin{array}{r} x - 2 \\ -x^2 \begin{array}{|c|c|} \hline -x^3 & 2x^2 \\ \hline 3x \begin{array}{|c|c|} \hline 3x^2 & -6x \\ \hline 5 \begin{array}{|c|c|} \hline 5x & -10 \\ \hline \end{array} \\ \hline \end{array} \end{array}$$

$$-x^3 + 2x^2 + 3x^2 - 6x + 5x - 10$$

$$-x^3 + 5x^2 - x - 10$$

$$(x+4)(-2x^2+5x+9)$$

$$\begin{array}{r} x \quad 4 \\ -2x^2 \begin{array}{|c|c|} \hline -2x^3 & -8x^2 \\ \hline 5x \begin{array}{|c|c|} \hline 5x^2 & 20x \\ \hline 9 \begin{array}{|c|c|} \hline 9x & 36 \\ \hline \end{array} \\ \hline \end{array} \end{array}$$

$$-2x^3 - 8x^2 + 5x^2 + 20x + 9x + 36$$

$$-2x^3 - 3x^2 + 29x + 36$$

$$(2x-5)(4x^2-3x-1)$$

$$\begin{array}{r} 2x - 5 \\ 4x^2 \begin{array}{|c|c|} \hline 8x^3 & -20x^2 \\ \hline -3x \begin{array}{|c|c|} \hline -6x^2 & 15x \\ \hline -1 \begin{array}{|c|c|} \hline -2x & 5 \\ \hline \end{array} \\ \hline \end{array} \end{array}$$

$$8x^3 - 20x^2 - 6x^2 + 15x - 2x + 5$$

$$8x^3 - 26x^2 + 13x + 5$$

The Box Method can be used for any multiplication of polynomials problem.

FOIL is ONLY used when you multiply a binomial x a binomial

Use FOIL and Box Method

$$(x^2y + 9y)(2x + 3y) \text{ FOIL}$$

$$2x^3y + 3x^2y^2 + 18xy + 27y^2$$

$$F = x^2y \cdot 2x = 2x^3y$$

$$(x^2y + 9y)(2x + 3y) \text{ BOX METHOD}$$

	$x^2y$	$9y$
$2x$	$2x^3y$	$18xy$
$3y$	$3x^2y^2$	$27y^2$

$$2x^3y + 18xy + 3x^2y^2 + 27y^2$$

$$V = l \cdot w \cdot h$$

You have a swimming pool in your backyard and your parents want to know the volume of the pool. You know the pool has a length of  $x + 3$ , a width of  $2x + 1$  and a depth of  $3x + 4$ . find the volume of the pool.

$$(x+3)(2x+1)(3x+4)$$

$$2x^2 + x + 6x + 3$$

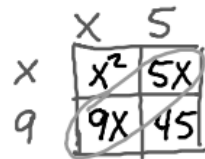
$$2x^2 + 7x + 3$$

$$(2x^2 + 7x + 3)(3x + 4)$$

	$2x^2$	$7x$	$3$
$3x$	$6x^3$	$21x^2$	$9x$
$4$	$8x^2$	$28x$	$12$

The dimensions of rectangle are  $x + 5$  and  $x + 9$ . Which expression represents the area of the rectangle?

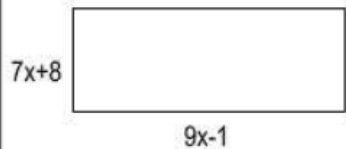
- A.  $x^2 + 45x$
- B.  $x^2 + 14x + 45$
- C.  $x^2 + 45$
- D.  $x^2 + 45x + 45$



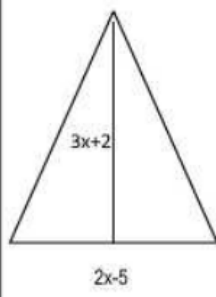
$$6x^3 + 29x^2 + 37x + 12$$

$$\rightarrow x^2 + 14x + 45$$

Find the area of the rectangle.



Find the area of the Triangle.



$$\frac{1}{2} (2x-5)(3x+2)$$

$$\frac{1}{2} (6x^2 + 4x - 15x - 10)$$

$$\frac{1}{2} (6x^2 - 11x - 10)$$

$$\frac{1}{2} \cdot \frac{11}{1} = \frac{11}{2}$$

$$\text{or } 5\frac{1}{2}$$

$$A = \frac{1}{2} b \cdot h$$

or

$$\frac{bh}{2}$$

Summary:

$$3x^2 - \frac{11}{2}x - 5$$

