

Objective

The student will be able to:

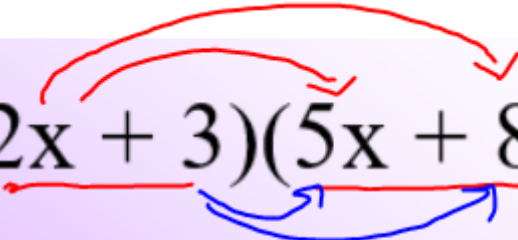
multiply two or more polynomials
using the FOIL method, Box method
and the distributive property.

There are three techniques you can use for multiplying polynomials.

It's all about how you write it...Here they are!

- 1)Distributive Property
- 2)FOIL
- 3)Box Method

1) Multiply. $(2x + 3)(5x + 8)$



Using the distributive property, multiply

$$\underline{2x}(5x + 8) + \underline{3}(5x + 8).$$

$$\underline{10x^2} + \underline{16x} + \underline{15x} + \underline{24}$$

Combine like terms.

$$\underline{10x^2} + \underline{31x} + 24$$

You try:

$$(\underline{4x} - \underline{1}) (\underline{3x + 5})$$

$$7x + 4$$

$$12x^2 + 17x - 5$$

$$4x(3x + 5)$$

$$-1(3x + 5)$$

$$12x^2 + 20x - 3x - 5$$

Hey!

$$12x^2 + 17x - 5$$

A shortcut of the distributive property is called the **FOIL** method.

The FOIL method is ONLY used when you multiply 2 binomials. It is an acronym and tells you which terms to multiply.

Remember, FOIL reminds you to
multiply the:

First terms

Outer terms

Innner terms

Last terms

2) Use the FOIL method to multiply the following binomials:

$$(y + 3)(y + 7).$$

$$F: y \cdot y = y^2$$

$$O: y \cdot 7 = 7y$$

$$I: 3 \cdot y = 3y$$

$$L: 3 \cdot 7 = 21$$

$$y^2 + 10y + 21$$

You try:

$$(3x^5 + 6y)(2x^3 - 10y)$$

$$F: 3x^5 \cdot 2x^3 = 6x^8$$

$$O: 3x^5 \cdot -10y = -30x^5y$$

$$I: 6y \cdot 2x^3 = 12x^3y$$

$$L: 6y \cdot -10y = \underline{-60y^2}$$

$$6x^8 - 30x^5y + 12x^3y - 60y^2$$

F.O.I.L.

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

F	O	I	L
$6x^5$	$-8x^3$	$+ 3x^2$	-4

3) Multiply $(\underline{3x} - \underline{5})(\underline{5x} + \underline{2})$

The third method is the Box Method.
This method works for every problem!

Here's how you do it.
Multiply $(3x - 5)(5x + 2)$

Draw a box. Write a polynomial on the top and side of a box. It does not matter which goes where.

$$15x^2 - 25x + 6x - 10$$

$$15x^2 - 19x - 10$$

	$3x$	-5
$5x$	$15x^2$	$-25x$
$+2$	$+6x$	-10

You try:

$$(4x - 1)(3x + 7)$$

	$4x$	-1	
$3x$	$12x^2$	$-3x$	$= \underline{\underline{12x^2 + 25x - 7}}$
$+7$	$28x$	-7	

4) Multiply $(7p - 2)(3p - 4)$

You have 3 techniques. Pick the one you like the best!

You try:

Multiply $(2a - 3b)(2a + 4b)$

F $4a^2$
O $8ab$
I $-6ab$
L $-12b^2$

$$= 4a^2 + 2ab - 12b^2$$

5) Multiply $(\underline{2x} - \underline{5})(x^2 - 5x + 4)$

$$\underline{2x}(x^2 - 5x + 4) - \underline{5}(x^2 - 5x + 4)$$

$$\underline{2x^3} - \underline{10x^2} + \underline{8x} - \underline{5x^2} + \underline{25x} - \underline{20}$$

Group and combine like terms.

$$2x^3 - 10x^2 - 5x^2 + 8x + 25x - 20$$

$$\underline{2x^3} - \underline{15x^2} + \underline{33x} - \underline{20}$$

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

You cannot use FOIL because they are not BOTH binomials. You must use the distributive property or box method.

	x^2	$-5x$	$+4$
$2x$	<u>$2x^3$</u>	$-10x^2$	$+8x$
-5	$-5x^2$	$+25x$	<u>-20</u>

$$2x^3 - 15x^2 + 33x - 20$$

You try:

Multiply $(2p + 1)(p^2 - 3p + 4)$

	p^2	$-3p$	$+4$
$2p$	$2p^3$	$-6p^2$	$+8p$
$+1$	p^2	$-3p$	$+4$

$$2p^3 - 5p^2 + 5p + 4$$

$$6) \quad \underbrace{(x - 2)(x + 3)}(2x - 5)$$

only mult.
2 at a
time

$$(x^2 + x - 6)(2x - 5)$$

$2x$	$2x^3$	$2x^2$	$-12x$
-5	$-5x^2$	$-5x$	$+30$

$$2x^3 - 3x^2 - 17x + 30$$

Polynomial Quotable

Check off when finished!

HW #2: Multiplying Polynomials