Math 9 – Unit 5: Algebra II Name: _____

Lesson #2: Multiplying Binomials Date: _____

Learning Goal: We are learning to multiply two binomials by using the distributive property.

Review: Expand by using the Distributive Property

1) $2x(4x+7)$

$= 8x^2 + 14x$

2) $-6x(x-6)$

$= -6x^2 + 36x$

As you can see, the monomial in front gets multiplied into each term of the binomial. What happens if we have two binomials being multiplied? We follow a very similar method! Let's illustrate our strategy by doing 12 x 17. But let's think of 12 as (10+2) and 17 as (10+7)

	10	+ 7
10	10x10 = 100	10x7 = 70
+ 2	10x2 = 20	2x7 = 14

100 + 70 + 20 + 14 = 204

204

$(10+2)(10+7)$

$= 100 + 70 + 20 + 14$

$= 204$

Notice that each term in our first bracket (10 and 2) gets multiplied by each term in our second bracket (10 and 7). So there are a total of four multiplications, that are then added together. This is called the "Double Distributive" property. You are distributing each term from the first bracket into the second. Since there are two terms in the first bracket, you have to distribute twice! This method is also called FOILing, but you'll find out why in a bit.

Expand by FOILing

3) $(4x-6)(7x+8)$

$= 28x^2 + 32x - 42x - 48$

$= 28x^2 - 10x - 48$

	7x	+8
4x	$28x^2$	32x
-6	-42x	-48

4) $(5v-7)(2v+2)$

$= 10v^2 + 10v - 14v - 14$

$= 10v^2 - 4v - 14$

Foiling also means get rid of brackets!

First

Outer

Inner

Last

5) $(8n+2)(3n-8)$

$= 24n^2 - 64n + 6n - 16$

$= 24n^2 - 58n - 16$

6) $(x+1)(3x-8)$

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

$= 3x^2 - 5x - 8$

7) $(5x+3)(5x-3)$

$= 25x^2 - 15x + 15x - 9$

$= 25x^2 - 9$

8) $(4x-7)^2$

$= (4x-7)(4x-7)$

$= 16x^2 - 28x - 28x + 49$

$= 16x^2 - 56x + 49$

Expand the binomials FIRST, then distribute the number in front.

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

$= 4(x^2 - 5x + 9x - 45)$

$= 4(x^2 + 4x - 45)$

$= 4x^2 + 16x - 180$

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

$= -\frac{1}{2}(x^2 + 4x - 10x - 40$

$= -\frac{1}{2}(x^2 - 6x - 40)$

$= -\frac{1}{2}x^2 + 3x + 20$

11) $-4(2v+2)(v+3)$

$= -4(2v^2 + 6v + 2v + 6)$

$= -4(2v^2 + 8v + 6)$

$= -8v^2 - 32v - 24$

12) $5(8x+9)^2$

$= 5(8x+9)(8x+9)$

$= 5(64x^2 + 72x + 72x + 81)$

$= 5(64x^2 + 144x + 81)$

$= 320x^2 + 720x + 405$

Success Criteria

- I can multiply two binomials by using the distributive property.