Multiplying Polynomials (Sec 5.5 and Sec 5.6)

Remember:

When multiplying or dividing ....

+ and + = +	− and + = −
− and − = +	+ and − = −

We will only be multiplying a polynomial by a monomial. The monomial could be a constant term, ex: 3(2x) or 3(2x + 2) or it could contain a variable, ex: 3x (2x) or 3x (2x + 2), etc.

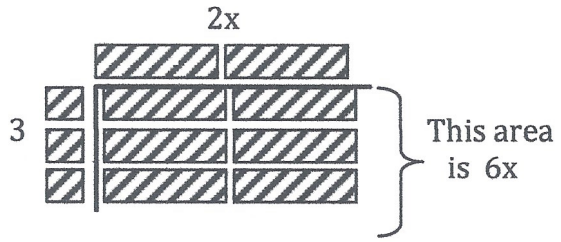
Students will be expected to multiply polynomials using symbolically, using area model and algebra tiles.

Example 1: 3 (2x)

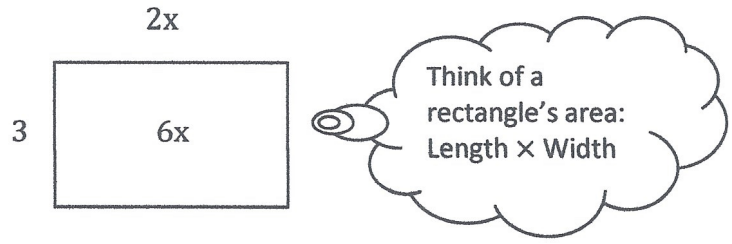
Using algebra: 3 (2x)

Just multiply the numbers.
3 (2x) = 6x

Using Algebra Tiles: 3 (2x)



Using Area model: 3 (2x)



Example 2: $3(2x + 2)$

Using algebra: $3\,(2x + 2)$

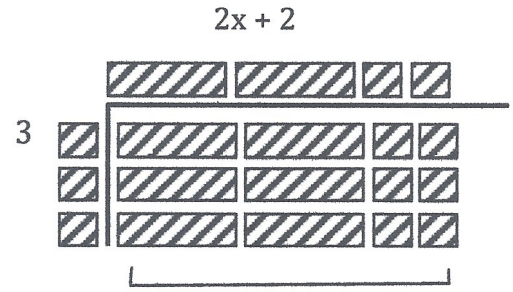
Use distributive property

Multiply each term of the polynomial inside the bracket by the monomial in front of the bracket.

Therefore: $3 \times 2x$ and 3×2

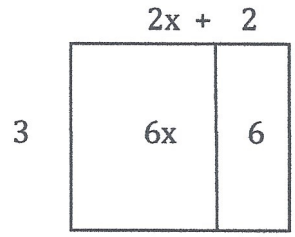
$$3\,(2x + 2) = 6x + 6$$

Using Algebra Tiles: $3\,(2x + 2)$



This area is $6x + 6$

Using Area model: $3\,(2x + 2)$



Area is $6x + 6$

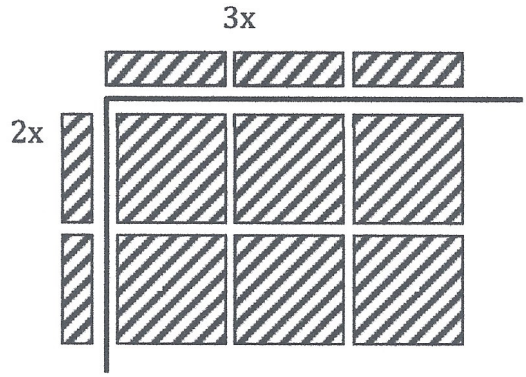
Example 3: $3x(2x)$

Using algebra: $3x\,(2x)$

Multiply the numbers and add exponents on the variable... Remember the exponent rules!

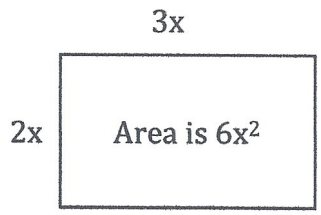
$$3x(2x) = 6x^2$$

Using Algebra Tiles: $3x\,(2x)$



This area is $6x^2$

Using Area model: $3x\ (\ 2x\ )$



Example 4: $3x(2x + 2)$

Using algebra: $3x\ (2x + 2)$

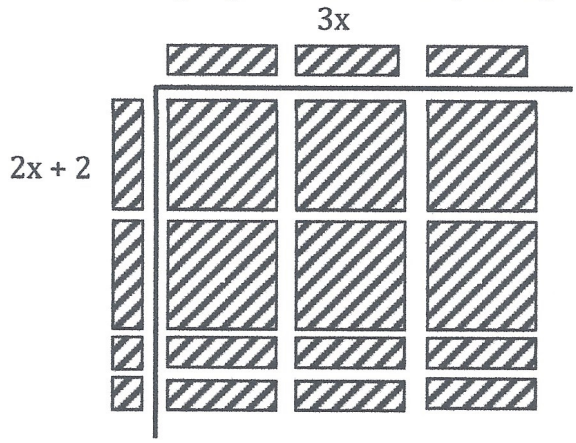
Use distributive property

Multiply each term of the polynomial inside the bracket by the monomial in front of the bracket. Don't forget exponent rule!

Therefore: $3 \times 2x$ and 3×2

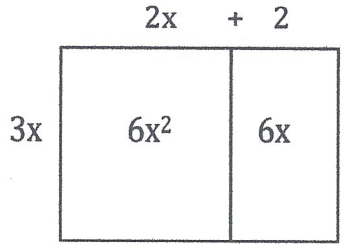
$$3x\ (2x + 2) = 6x^2 + 6x$$

Using Algebra Tiles: $3x\ (\ 2x + 2)$



This area is $6x^2 + 6x$

Using Area model: $3\ (\ 2x + 2)$

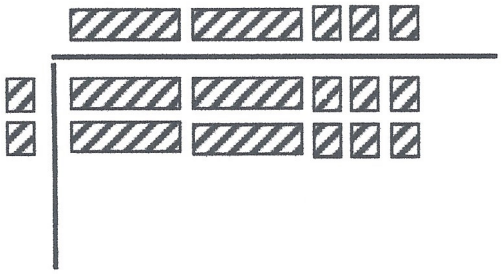


Area is $6x^2 + 6x$

Try These!

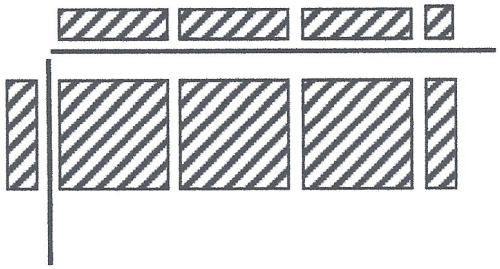
1. Multiply using algebra tiles.

A). $2(2x + 3)$



Answer: $4x + 6$

B). $x(3x + 1)$



Answer: $3x^2 + x$

2. Multiply using distributive property...using algebra. Careful with signs!

A). $3(-2m + 4)$

$= -6m + 12$

B). $-4(x + 2)$

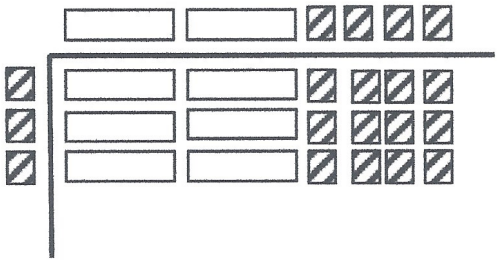
$= -4x - 8$

C). $-2(-n^2 + 2n - 1)$

$= 2n^2 - 4n + 2$

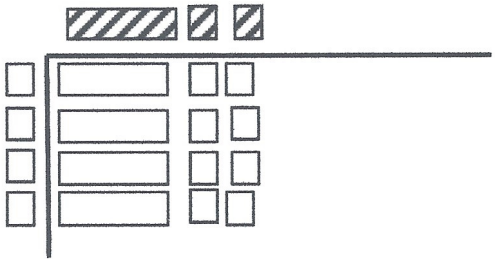
3. How would you sketch negatives with algebra tiles ?

A). $3(-2m + 4)$



Answer: $= -6m + 12$

B). $-4(x + 2)$



Answer: $= -4x - 8$

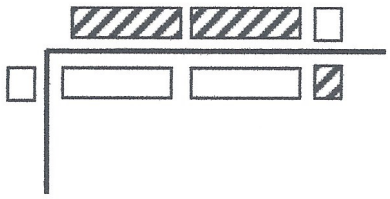
Always keep in mind:

+ and + = + − and + = −

− and − = + + and − = −

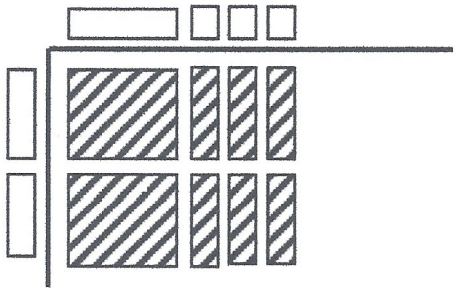
4. Try These using algebra tiles! Check your answer using algebra.

A). $-(2x-1)$



Answer: $-2x+1$

B). $-2x(-x-3)$



Answer: $2x^2+6x$

5. Sketch the answer using the area model: $-2(-n^2+2n-1)$

	$-n^2$	$+2n$	-1
-2	$2n^2$	$-4n$	$+2$

Answer: $= 2n^2-4n+2$

6. Multiply using distributive property.

A:	$2(x+10)$	**B:**	$5y(y+1)$	**C:**	$-10(x+2)$
	$=2x+20$		$=5y^2+5y$		$=-10x-20$
D:	$6x(12-x)$	**E:**	$3(x-7)$	**F:**	$-4x(2x-3)$
	$=72x-6x^2$		$=3x-21$		$=-8x^2+12x$
G:	$-6m(m+4)$	**H:**	$-8(x-5)$	**I:**	$3(-8-7x)$
	$=-6m^2-24m$		$=-8x+40$		$=-24-21x$