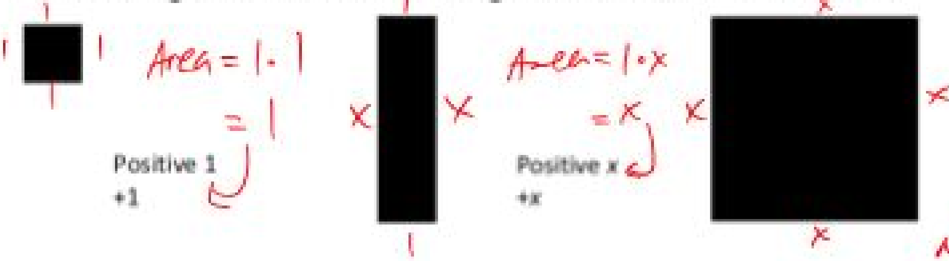
Math 9 Section 5.3 – Multiplying Polynomials

Homework: Section 5.3 on Pg. 181; #1-3half, 4-5all, 6a, 7-10half

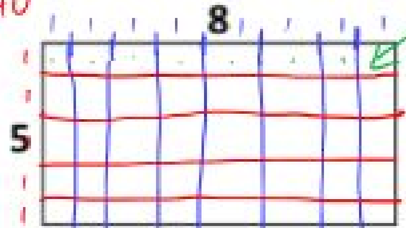
Recall our algebra tiles and how we figured out the value of each tile:



When we calculate the area of a rectangle, we multiply the sides together.

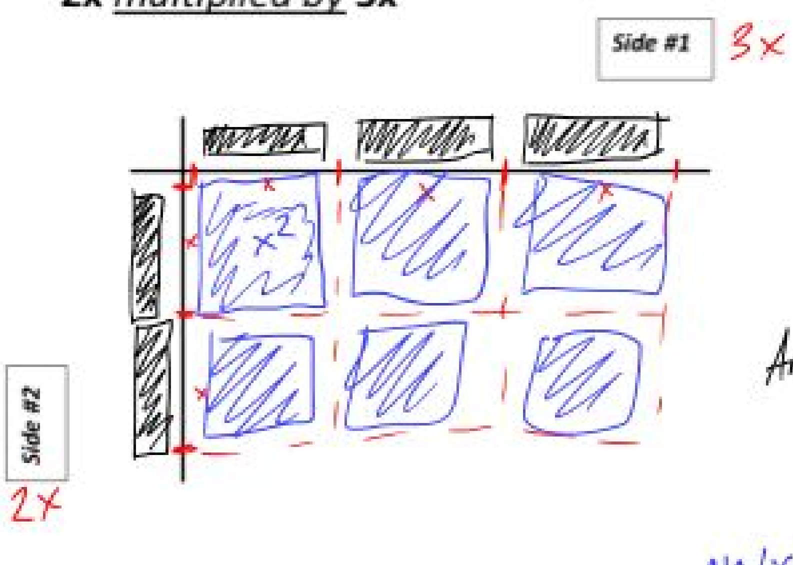
If we want to find the answer for two numbers multiplied together, that's the same as finding the area of a rectangle with the length equal to the first number and width equal to the second number.

Area = $5 \cdot 8 = 40$



This idea also works for polynomials, and we can use the algebra tiles to "measure out" the sides of the rectangle.

2x *multiplied by* 3x

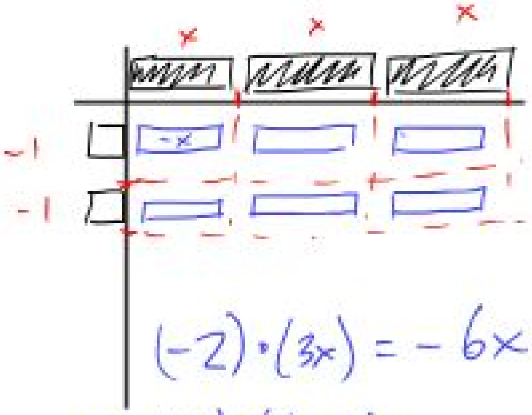


$\text{Area} = 2x \cdot 3x$

$= 6x^2$

Notice $6 = 2 \cdot 3$ and $x^2 = x \cdot x$

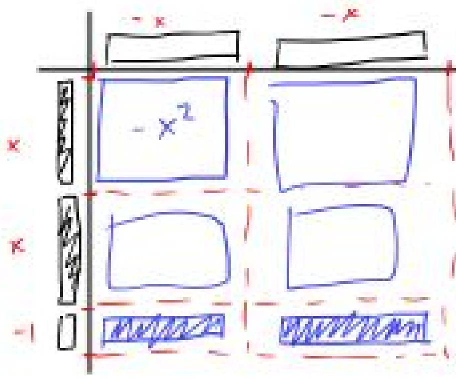
–2 *multiplied by* **3x**



$(-2)\cdot(3x) = -6x$

Notice $(-2)\cdot(3) = -6$

–2x *multiplied by* **2x – 1**



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

From our algebra tile pictures, we can see the pattern for multiplying polynomials:

1. Multiply the coefficients (numbers) } put together
2. Multiply the variables (letters) }
3. If you have 2 or more terms, distribute the multiplication (like subtracting polynomials)

$(-3x^2)(-7x)$ = $[(-3)\cdot(-7)]\cdot[x^2\cdot x^1]$ $= 21x^3$

same base: $2^2\cdot 2^1 = 2^3$

$(-4x^2y)(x^4y^7)$= $[(-4)\cdot(1)]\cdot[x^2y\cdot x^4y^7]$ $= -4x^6y^8$

diff bases (can't combine)

$(-2x)(3x^2 - 5)$ = $(-2x)\cdot(3x^2) + (-2x)(-5)$ $= -6x^3 + 10x$

$(3x + 2y)(xy)$ = $(3x)\cdot(xy) + (2y)\cdot(xy)$ $= 3x^2y + 2xy^2$

$(2x^2 - x + 4)(-3x^2)$ = $(2x^2)(-3x^2) + (-x)(-3x^2) + (4)(-3x^2)$ $= -6x^4 + 3x^3 - 12x^2$