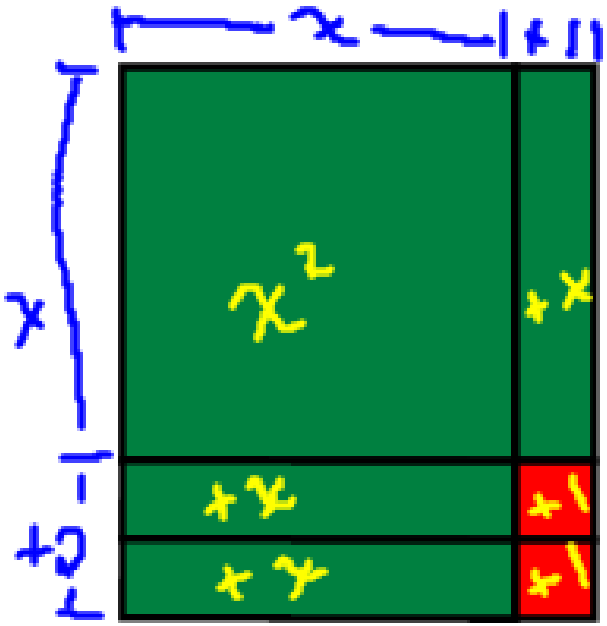
3.5 Polynomials of the Form $x^2 + bx + c$

many terms

binomial = two terms

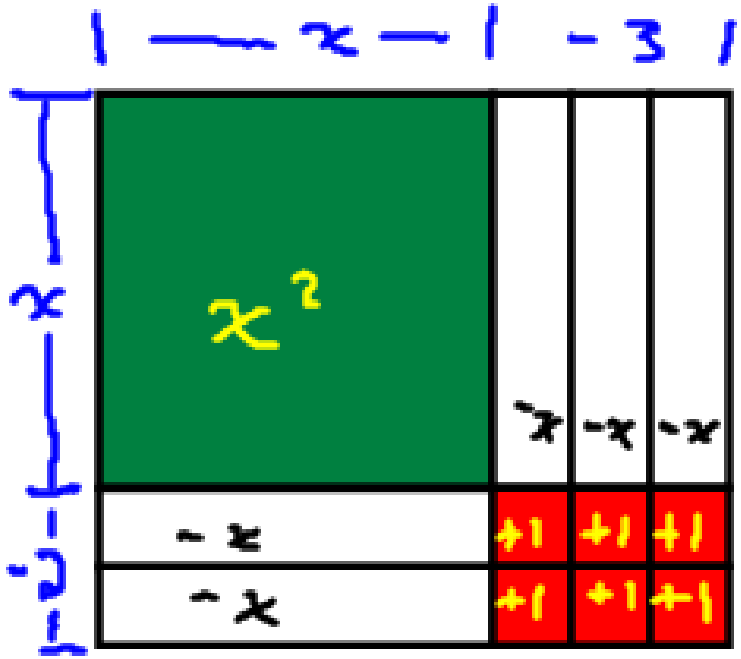
three terms

Trinomial Factoring



$x^2 + 3x + 2 =$

$(x+1)(x+2)$



$x^2 - 5x + 6$

$= (x-3)(x-2)$

$x^2 + 3x + 2 = (x+2)(x+1)$

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

$x^2 + 7x + 10 = (x+2)(x+5)$

$x^2 + 10x + 16 = (x+2)(x+8)$

Is there a pattern?

$x^2 + 3x + 2 = (x+2)(x+1)$

factors of 2

add to 3.

① Factor

$x^2 + 9x + 20$

$= (x+4)(x+5)$

Factors of 20

1	20
2	10
4	5
−1	−20
−2	−10
−4	−5

−?

* check by expanding

FOIL*

First, outside, inside, Last

$x^2 + 5x + 4x + 20$

$x^2 + 9x + 20$ ✓

② Factor

$x^2 + 12x + 32$

$= (x + 4)(x + 8)$

Factors of 32

1	32
2	16
4	8
−1	−32
−2	−16
−4	−8

* check:

$x(x+8) + 4(x+8)$

$x^2 + 8x + 4x + 32$

$x^2 + 12x + 32$ ✓

(3) $x^2 + x - 12$ tells you that the positive factor is bigger.

+ in front is 1

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

$x^2 + 4x - 3x - 12$

$x^2 + x - 12$ ✓

Factors -12

1	-12	
-1	12	
2	-6	
-2	6	-11
-3	4	1
3	-4	-1 ✗

④ Factor: $x^2 - 4x - 12$

$= (x+2)(x-6)$

*check!

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

$x^2 - 6x + 2x - 12$

$x^2 - 4x - 12$ ✓

Factors -12

-1	12
1	-12
-2	6
2	-6
-3	4
3	-4

Fill in the blanks

$x^2 + \boxed{8}x + 12 = (x+6)(x+2)$

$x^2 + 3x + \boxed{2} = (x+1)(x+2)$

$x^2 + \boxed{-3}x - 28 = (x-7)(x+\boxed{4})$

p. 166 - #4, 5, 9-11

algebra tiles