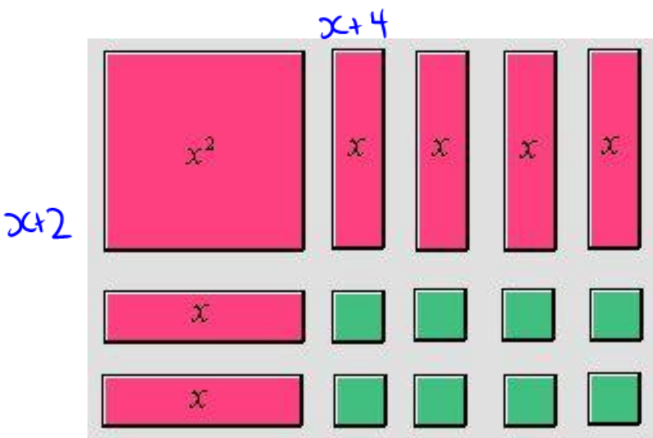
5.3a Factoring Trinomials of the form x^2+bx+c

What Trinomial is represented by these algebra tiles?______________________



$(x+4)(x+2) = x^2+6x+8$

$(x+3)(x+5) = x^2+8x+15$

$3+5$ $\quad$ 3×5

Tiles placed along the top side and left side, represent the

factors: $x+2$ and $x+4$.

We can check our conclusion by multiplying the two binomials.

$$(x+2)(x+4) = x^2+4x+2x+8$$

Thus, the trinomial x^2+6x+8 is a product of $x+2$ and $x+4$.

Model the trinomials x^2+5x+6 and x^2+3x+2 with algebra tiles. What are the binomial factors that multiply to give each as a product?

x^2+5x+6

← too many x's
not 1x6

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

x^2+3x+2

possible
factors of 2
1x2

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

We can also factor without the use of manipulatives. When trinomials are of the form x^2+bx+c, a pattern forms between the b term and the c term.

Trinomial	Binomial Factor	Binomial Factor
x^2+5x+6	$x+3$	$x+2$
$x^2+8x+12$	$x+2$	$x+6$
$x^2+3xy-18y^2$	$x+6y$	$x-3y$
x^2+4x+6	Cannot be factored	

What patterns do you notice in the table above?

the constant term is the product

"x" term is the sum

We can factor by listing the factors of the c term and then choosing the two which ADD to give the b term.

Factor: $x^2+11x+24$ Factors of 24: -8×-3 -6×-4 -24×-1 -12×-2 8×3 6×4 24×1 12×2

Two factors that add/subtract to +11: 8 and 3

$(x+8)(x+3)=x^2+11x+24$ $x^2-10x+24=(x-6)(x-4)$

$x^2+12x+20$	n^2+5n+6	$n^2-5n-24$	p^2+p-90
$(x+10)(x+2)$	$(n+3)(n+2)$	$(n-8)(n+3)$	$(p+10)(p-9)$
	n^2-5n+6	$x^2+6xy+5y^2$	x^4+7x^2+12
	$(n-3)(n-2)$	$(x+y)(x+5y)$	$(x^2+3)(x^2+4)$

REMEMBER! Always look for a GCF first!

$4x^2+12x+8 = 4(x^2+3x+2)$

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

$2x^2+8x+6$	$-4x^2-4x+48$	$x^4+8x^3+12x^2$
GCF:	GCF:	GCF:
$2(x^2+4x+3)$	$-4(x^2+x-12)$	$x^2(x^2+8x+12)$
$2(x+3)(x+1)$	$-4(x+4)(x-3)$	$x^2(x+6)(x+2)$

5.3 extra practice #1-4

p234 # 1,4,5,8a 9,10,13,16