

**Standard form for a quadratic relationship:**

$$ax^2 + bx + c$$

**What pattern did you notice from the factoring you did on last night's homework?**

The two numbers in the binomials of the factored form when added together were equal to  $b$ , and when multiplied were equal to  $c$ .

Expand the following:

$$(dx + e)(fx + g)$$

$$\boxed{ax^2 + bx + c}$$

$$(dx + e)(fx + g)$$
$$dfx^2 + dgx + efx + eg$$

What do we notice?

The the sum of the factors of "ac" is equal to "b".

# Factoring Methods

"Box" or Factor by Grouping

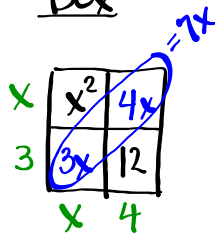
$$ax^2 + bx + c$$

Same for both methods!

$x^2 + 7x + 12$	Factors of a.c	Sum
	1, 12	13
	2, 6	8
	3, 4	7

Rewrite the original equation:  
 $x^2 + 7x + 12$   
 $x^2 + 3x + 4x + 12$

Box



$$(x+4)(x+3)$$

Steps for factoring using Box

- Find factors of  $ac$  whose sum =  $b$
- Rewrite eq by "splitting up"  $bx$  term
- Put all pieces in the Box (like terms on the diagonal)
- Find GCF's

Factor by Grouping

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

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

$$x(x+3) + 4(x+3)$$

$$(x+4)(x+3)$$

Steps for factoring by Grouping

- Find factors of  $ac$  whose sum =  $b$
- Rewrite eq by "splitting up"  $bx$  term
- 'Split' equation into 2 pieces.
- Find GCF's