

write all factors of 12 → 1, 2, 3, 4, 6, 12  
 24 → 1, 2, 3, 4, 6, 8, 12, 24  
 18 → 1, 2, 3, 6, 9, 18

FoIL (x+2)(x-1) (x+4)(x+5)

Skip ahead to 4.2 My bad!

# 4.3 Solve $x^2 + bx + c = 0$ by Factoring

\* Your favorite 'F' word

Monomial - A #, variable or a combo ex: 4,  $-3x^2$ ,  $z^8y^{16}$

Binomial - Sum of 2 monomials ex:  $2x+1$ ,  $-23x-70x$

Trinomial - Sum of 3 monomials ex:  $x^2-3x+2$

↳ what we will work with

## Factoring Trinomials

\* Undo FOIL

$$x^2 - 9x + 20$$

← Want 2 factors of 20 that add up to -9

- 1 · 20
- 2 · 10
- ~~4 · 5~~
- AND
- 1 · -20
- 2 · -10
- ~~-4 · -5~~

1<sup>st</sup> - Write all factors of the constant term (the last term - w/o any variable)

2<sup>nd</sup> - Find the factors whose sum is the middle term

Humm...  $-4 + -5 = -9$

3<sup>rd</sup> - Write the 2 binomials with those factors

$$(x-4)(x-5)$$

①  $x^2 + 22x + 21$

- 1 · 21
- ~~3 · 7~~
- 1 · -21
- 3 · -7

$$22 = (1+21)$$

$$(x+1)(x+21)$$

②  $x^2 - 4x - 21$

- 1 · -21
- ~~3 · -7~~
- 1 · 21
- 3 · 7

← multiply to -21

$$-4 = (3+7)$$

$$(x+3)(x-7)$$

③  $x^2 + 5x + 2$

1 · 2  
-1 · -2 } None add to 5, so cannot be factored

# "Special" Patterns

Ⓐ  $d^2 + 12d + 36$

1-36  
2-18  
3-12  
4-9  
6-6 = 12  
-1-36

Ⓑ  $z^2 - 6z + 9$

1-9  
3-3  
-1-9  
-3-3 = -6

Ⓒ  $y^2 - 49$

Think  $y^2 + 0y - 49$

1-49  
7-7  
-1-49  
-7-7 = 0

$(d+6)(d+6)$  Hey, are →  
=  $(d+6)^2$  same binomials!  $(z-3)(z-3)$   
=  $(z-3)^2$

$(y-7)(y+7)$

Perfect Square Trinomial ↗

Difference of 2 Squares

prss: 3-23 odd