

## 9.6 Factoring Special Polynomials

One special polynomial is the "perfect square trinomial"

- A three-term polynomial
- 1<sup>st</sup> and 3<sup>rd</sup> terms are perfect Squares.

ALWAYS  
LOOK FOR  
GCF first!

Rule for factoring a Perfect Square Trinomial

$$a^2 + 2ab + b^2 = (a+b)(a+b) \text{ or } (a+b)^2$$

$$a^2 - 2ab + b^2 = (a-b)(a-b) \text{ or } (a-b)^2$$

Recall Special  
binomial products;  
just backwards

Example #1  $x^2 + 10x + 25 = (x+5)(x+5)$   
 Trinomial? Yes  
 1<sup>st</sup>/3<sup>rd</sup> P.S.? Yes  
 or  $(x+5)^2$

★ Note how the middle term is twice (a.b).

Ex #2:  $4b^2 - 32bc + 64c^2$   
 $\uparrow \quad \uparrow \quad \uparrow$   
 P.S.? ✓ 2ab? P.S.? ✓  
 $(2b-8c)(2b-8c)$

Ex #3  $16x^2 + 8xy + y^2$   
 $\uparrow \quad \uparrow \quad \uparrow$   
 P.S.? ✓ 2ab? ✓ P.S.? ✓  
 $(4x+y)(4x+y)$

## Factoring Difference of Squares

★ Will be a binomial ★

Rule:  $a^2 - b^2 = (a+b)(a-b)$

Both terms are perfect Squares

Ex #1

$4x^2 - 16$   
 $\uparrow \quad \uparrow$   
 P.S.? P.S.?

$(2x-4)(2x+4)$

Ex #2

$9g^2 - 25g^4$   
 $(3g+5g^2)(3g-5g^2)$

Ex #3

$36x^3 - 81x$  ★ GCF?  
 $x(36x^2 - 81)$  ★ Now P.S.  
 $(x)(6x+9)(6x-9)$

## Perfect Squares

★ any variable(s)  
Squared

1, 4, 9, 16, 25, 36,  
 49, 64, 81, 100, 121,  
 144, 169, 196, 225,  
 289, 324, 361, 400

C.W. Pg 455 (18-42 Evens)  
 H.W. Pg 455 (19-41 odds)

Quiz next class 9.5/9.6

Ex #4  $x^4 - 1$  ★ GCF?  
 $(x^2+1)(x^2-1)$  ← Another  
 $(x^2+1)(x+1)(x-1)$  Diff of Squares