

## Difference of Two Squares

What is  $(x+5)(x-5)$ ?

$$x^2 - 5x + 5x - 25 = x^2 - 25$$

When multiplied, the middle term drops out leaving just two terms.

What would  $(a+b)(a-b)$  equal?  $a^2 - ab + ab - b^2 = a^2 - b^2$

Can you guess what two factors formed:  $x^2 - 100$ ?

Can you guess what two factors formed:  $121x^2 - 100y^2$ ?

### Factoring the Difference of Two Squares

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

1. Identify that the binomial is of the form a perfect square minus another perfect square.
2. Rewrite the problem as a first term squared minus a second term squared.  
 $(1^{\text{st}} \text{ term})^2 - (2^{\text{nd}} \text{ term})^2$
3. Factor the problem into the first term plus the second term times the first term minus the second term.  
 $(1^{\text{st}} \text{ term} + 2^{\text{nd}} \text{ term})(1^{\text{st}} \text{ term} - 2^{\text{nd}} \text{ term})$

$$y^2 - 36 = (y)^2 - (6)^2 = (y+6)(y-6)$$

$$144y^2 - 49z^2 = (12y)^2 - (7z)^2 = (12y+7z)(12y-7z)$$

TRY:

$$x^2 - 121$$

$$9x^2 - 1$$

$$81 - y^2$$

$$16y^2 - 9$$

$$x^2y^2 - 9z^2$$