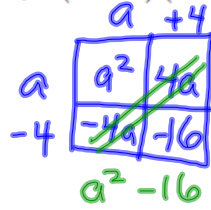


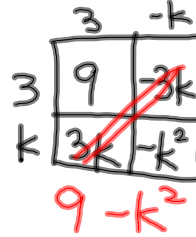
Section 5.6 Objective: Difference of two perfect squares

Review Examples: Multiply the following:

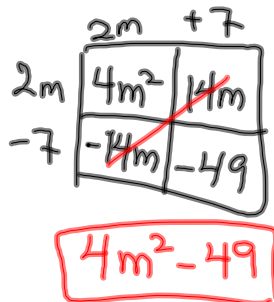
a)  $(a+4)(a-4)$



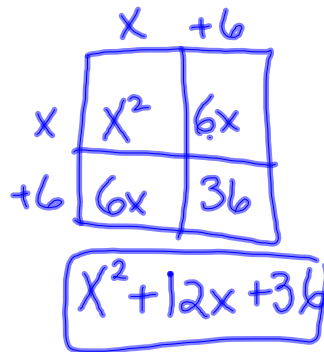
b)  $(3-k)(3+k)$



c)  $(2m+7)(2m-7)$



d)  $(x+6)(x+6)$



**Factoring a Difference of Squares:**

- A polynomial of the form  $A^2 - B^2$  is called a **difference of squares**.
- Differences of squares always factor as follows:  $A^2 - B^2 = (A+B)(A-B)$

★ This only works if **both terms are perfect squares** and you are subtracting.

★ Don't forget to check for a GCF first!

Steps:

1. Factor out the GCF if there is one.
2. If there are two terms and both terms are perfect squares with a minus sign between them like this:

$A^2 - B^2$

3. Then factor into two parentheses putting the (square root of the first + the square root of the second) times the (square root of the first - the square root of the second) or  $(A+B)(A-B)$

**Examples:** Factor the following polynomials.

a)  $x^2 - 25$

$(x+5)(x-5)$

b)  $m^2 - 81$

$(m+9)(m-9)$

c)  $w^2 + 36$

prime  
add in the middle

d)  $49 - n^2$   
 $(7+n)(7-n)$

e)  $4t^2 - 1$   
 $(2t+1)(2t-1)$

f)  $9z^2 - 16$   
 $(3z+4)(3z-4)$

g)  $64y^2 - 81x^2$   
 $(8y+9x)(8y-9x)$

h)  $144k^2 + 25$   
 prime  
 + instead of -

i)  $2a^2 - 242$   
 GCF  $2(a^2 - 121)$   
 $2(a+11)(a-11)$

j)  $3 - 75p^2$   
 GCF 3  
 $3(1 - 25p^2)$   
 $3(1+5p)(1-5p)$

|     |     |                   |
|-----|-----|-------------------|
|     | 1   | 5p                |
| 1   | 1   | 5p                |
| -5p | -5p | -25p <sup>2</sup> |

k)  $100q^4r^2 - 9$   
 $(10q^2r+3)(10q^2r-3)$

$\sqrt{100} = 10$   
 $\sqrt{q^4} = q^2$   
 $\sqrt{r^2} = r$   
 $\sqrt{9} = 3$

$$1) x^4 - 16$$

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

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