Section 5.6 **Objective: Difference of two perfect squares**

Review Examples: Multiply the following:

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

	a	$+4$
a	a^2	$4a$
-4	$-4a$	-16

a^2-16

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

	3	$-k$
3	9	$-3k$
k	$3k$	$-k^2$

$9-k^2$

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

	$2m$	$+7$
$2m$	$4m^2$	$14m$
-7	$-14m$	-49

$4m^2-49$

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

	x	$+6$
x	x^2	$6x$
$+6$	$6x$	36

$x^2+12x+36$

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	$-25p^2$

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) $x^4 - 16$

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

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