Chapter 5 Section 5
Factoring Special Forms

One can use the trinomial method of factoring these polynomials, but if one can identify these patterns, then the factoring can be done quicker.

Factoring the Difference of Two Squares.
A and B are real numbers, variables, or algebraic expressions then
$A^2 - B^2 = (A - B)(A + B)$
factoring is the sum and difference of the numbers being squared.

Example 1: page 365
Factor
a) $9x^2 - 100$ b) $36y^6 - 49x^4$

Solution
Rewrite as a difference of two squares
a) $(3x)^2 - (10)^2$
Since 3x and 10 are being squared, the factors are the sum and difference of these two values
(3x – 10)(3x + 10)

b) $(6y^3)^2 - (7x^2)^2$

Example 2: page 366
Factor: $3y - 3x^6y^5$
Solution: Look for the GCF before . . .

Example 4
Factor completely
$x^3 + 5x^2 - 9x - 45$

Solution:
Factor by groups, table

$(x^3 + 5x^2) + (-9x - 45)$

Table:

	x^3	$5x^2$
	$-9x$	-45

Find the common factors

Factoring Perfect Square Trinomials
Again, this is not needed since it is a trinomial. If one recognizes this type of trinomial, then it can be factored quicker.

$A^2+2AB+B^2$
$(A+B)^2$

$A^2-2AB+B^2$
$(A-B)^2$

To recognized a perfect square trinomial:
1) First and last terms are squares
2) middle term is twice the product of the first and last term being squared.

Example 5: page 367
a) $x^2+14x+49$

b) $4x^2-12xy+9y^2$

Factoring by Grouping
$x^2-10x+25-y^2$

Factoring the Sum or Difference of Two Cubes

A^3-B^3
$(A+B)(A^2-AB+B^2)$

A^3+B^3
$(A-B)(A^2+AB+B^2)$

Example 8: Page 369
a) x^3-125

b) x^6+64y^3