> **Factoring $a^2(f(x))^2 - b^2(g(y))^2$ where $f(x)$ and $g(y)$ are Monomials**

The method of difference of squares in which $a^2 - b^2 = (a - b)(a + b)$ can also be extended to include examples where a and b represent polynomials.

The following process can be used to factor $x^4 - 16y^4$.

$x^4 - 16y^4$ can be written $(x^2)^2 - (4y^2)^2$.

Make the substitution $A = x^2$ and $B = 4y^2$ so the expression becomes $A^2 - B^2$ which factors to $(A - B)(A + B)$.

Replace A by x^2 and B by $4y^2$ to get $(x^2 - 4y^2)(x^2 + 4y^2)$, which factors further to $(x - 2y)(x + 2y)(x^2 + 4y^2)$.

In this example $f(x) = x^2$ and $g(y) = y^2$.

Class Ex. #3 Factor completely.

a) $k^4 - 1$

$(K^2+1)(K^2-1)$

$(K^2+1)(K+1)(K-1)$

b) $80a^4 - 5x^4$

$5(16a^4 - x^4)$

$5(4a^2 + x^2)(4a^2 - x^2)$

$5(4a^2 + x^2)(2a+x)(2a-x)$

c) $2p^5q^4 - 162pt^4$

$2p(p^4q^4 - 81t^4)$

$2p(p^2q^2 + 9t^2)$

$(p^2q^2 - 9t^2)$

$2p(p^2q^2 + 9t^2)(pq + 3t)$

$(pq - 3t)$

> **Complete Assignment Questions #3 - #4**

> **Factoring $a^2(f(x))^2 - b^2(g(y))^2$ where $f(x)$ and/or $g(y)$ are Binomial(s)**

Class Ex. #4 Factor completely.

a) $a^2 - (b - c)^2$ let $n = b-c$

$a^2 - n^2$

$(a+n)(a-n)$

$(a+(b-c))(a-(b-c))$

$(a+b-c)(a-b+c)$

b) $(2x - y)^2 - (x + y)^2$ let $A = 2x-y$

let $B = x+y$

$A^2 - B^2$

$(A+B)(A-B)$

$((2x-y)+(x+y))((2x-y)-(x+y))$

$3x(x - 2y)$

Class Ex. #5

Factor the expression $36(x+5)^2 - 49(x-8)^2$.

(handwritten) let ☺ = x+5

let ☹ = x-8

$36 ☺^2 - 49 ☹^2$

$(6☺ + 7☹)(6☺ - 7☹)$

$(6(x+5) + 7(x-8))(6(x+5) - 7(x-8))$

$(6x+30+7x-56)(6x+30-7x+56)$

$(13x-26)(-x+86)$

$13(x-2)(86-x)$

Complete Assignment Questions #5 - #11

Assignment

(handwritten) #3-5 all

Quiz on Factoring Tuesday

1. Factor.

a) $16x^2 - 49y^2$

b) $25a^2 - 121y^2$

c) $p^2q^2 - r^2s^2$

d) $16x^2 - 4y^2$

e) $9a^2b^2 - 36c^2$

f) $12a^2 - 75p^2q^2$

g) $4xy^3 - 169x^3y$

h) $60a^2b^2 - 15a^4b^4$

i) $4b^2g^2 - 49t^2z^2$

j) $25x^2 + 100y^2$

k) $225a^2c^2 - 16b^2d^2$

l) $xw^2y^2 - x^3z^2$

m) $1 - \cos^2 x$

n) $\sin^2 x - \cos^2 x$

o) $\dfrac{x^2}{64} - \dfrac{y^2}{49}$