Difference of Squares $a^2 - b^2 = (a+b)(a-b)$	$4x^2 - 3$	
Factor By Grouping	$x^3 - 4x^2 - 9x + 36$	
Sum/Difference of Cubes $a^3 - b^3 = (a-b)(a^2+ab+b^2)$	$64x^3 + 1$ $64x^3 - 1$ $(4x-1)(16x^2+4x+1)$	$a = 4x$ $b = 1$

EX #1: What are the real or imaginary solutions of each equation?

$=0$

$i=\sqrt{-1}$

$i^2=-1$

Factored Form

A. $(x^2-1)(x^2+4)=0$

$x^2-1=0$ $\quad x^2+4=0$

$x^2=\sqrt{1}$ $\quad \sqrt{x^2}=\sqrt{-4}$ $\quad x=\sqrt{-1}\cdot\sqrt{4}$

$x=\pm 2i$

$x=1 \quad x=-1 \quad x=2i \quad x=-2i$

Standard

B. $x^5+4x^3=5x^4-2x^3$

$-5x^4+2x^3 \quad -5x^4+2x^3$

$x^5-5x^4+6x^3=0$

$x^3(x^2-5x+6)=0$

a·c

6

$-2 \quad -3$

-5

$x^3(x-3)(x-2)=0$

$\sqrt[3]{x^3}=\sqrt[3]{0}$ $\quad x-3=0$ $\quad x-2=0$

$x=0 \quad x=3 \quad x=2$

EX #2: Find the real or imaginary solutions for each polynomial equation.

A. $x^4 = 16$

$x^4 - 16 = 0$

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

$-16 \quad -16$

$(x^2 - 4)(x^2 + 4) = 0$

$\sqrt{x^2} = \sqrt{4}$ $\qquad$ $\sqrt{x^2} = \sqrt{-4}$

$x = \pm 2$

$x = \pm 2i$

B. $x^3 + 8x - 2x^2$

$-8x + 2x^2 \quad -8x + 2x^2$

$x^3 + 2x^2 - 8x = 0$

$x(x^2 + 2x - 8) = 0$

a·c

-8

$4 \quad -2$

$+2$

b

$x(x+4)(x-2) = 0$

$x = 0 \quad x = -4 \quad x = 2$

C. $x(x^2 + 8) = 8(x + 1)$