Perfect Cubes

1, 8, 27, 64, 125, ...

1^3 2^3 3^3 4^3 5^3

Factoring the difference of perfect cubes:

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Factor the following:

1. $8x^3 - 125 = (2x - 5)(4x^2 + 10x + 25)$

$a = 2x$

$b = 5$

Factor:

2. $27m^3 - 64 = (3m - 4)(9m^2 + 12m + 16)$

$a = 3m$

$b = 4$

Is there a way to factor the sum of perfect cubes?

YES $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Factor the following:

1. $64x^3 + 1 = (4x + 1)(16x^2 - 4x + 1)$

$a = 4x$

$b = 1$

Factor:

2. $125m^3 + 216p^3$ =

$(5m+6p)(25m^2-30mp+36p^2)$

$a = 5m$

$b = 6p$

Solving equations using the sum/diff of cubes formulas:

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

These Quadratics are NEVER factorable.

You must use the Quadratic Formula to find these two solutions

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

Find ALL solutions, real and imaginary by factoring

$8x^3 + 1 = 0$

$a = 2x$

$b = 1$

$(2x+1)(4x^2-2x+1)$

$\frac{2 \pm \sqrt{-12}}{8} = \frac{2 \pm 2i\sqrt{3}}{8}$

$x = -\frac{1}{2}, \frac{1 \pm i\sqrt{3}}{4}$

Find ALL solutions, real and imaginary by factoring

$27d^3 - 64 = 0$

$a = 3x$

$b = 4$

$(3x-4)(9x^2+12x+16)$

$\frac{-12 \pm \sqrt{-432}}{18}$ $144 \cdot 3$

$\frac{-12 \pm 12i\sqrt{3}}{18}$

$x = \frac{4}{3}, \frac{-2 \pm 2i\sqrt{3}}{3}$

You can now finish Hwk #30: Sec 6-4

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Problems 12, 14, 16, 45, 48, 54, 57

Due tomorrow