

# Honors Algebra II

## Notes Section 24

### Factor and Solve Polynomial Equations

**EXAMPLE 1** Factor completely.

a)  $x^3 + 2x^2 - 15x$

b)  $2y^5 - 18y^3$

c)  $4z^4 - 16z^3 + 16z^2$

Sum of Two Cubes:  $a^3 + b^3 =$  \_\_\_\_\_

Difference of Cubes:  $a^3 - b^3 =$  \_\_\_\_\_

**EXAMPLE 2** Factor completely.

a)  $x^3 + 64 =$

b)  $16z^5 - 250z^2 =$

c)  $16b^5 + 686b^2 =$

**EXAMPLE 3** Factor by grouping.

a)  $x^3 - 3x^2 - 16x + 48$

b)  $27t^3 + 45t^2 - 3t - 5$

**EXAMPLE 4** Factor completely.

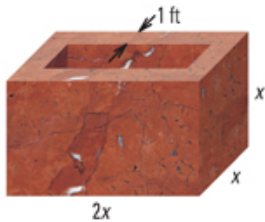
a)  $16x^4 - 81$

b)  $2p^8 + 10p^5 + 12p^2$

**EXAMPLE 5** What are the real number solutions.

a)  $3x^2 + 15x = 18x^3$

b)  $-27x^3 + 15x^2 = -6x^4$

**EXAMPLE 6**

You are designing a basin that will hold a fountain. The sides and bottom should be 1 foot thick. Its outer length should be twice its outer width and outer height.

What should the outer dimensions be if it is to hold  $36\text{ ft}^3$  of water?

**Volume = Interior Length  $\times$  Interior Width  $\times$  Interior Height**