#5 ~ Sect. 6.4: Solving Polynomial Equations

Ex. 1: Solve the equation by graphing. Check your answers.

$$x^3 + 3x^2 = x + 3$$

To solve by graphing:
Step 1 ~ Graph each side of the equation separately
Step 2 ~ Find the x-values at the point(s) of intersection

Step 1 ~

Graph $y_1 = x^3 + 3x^2$ and $y_2 = x + 3$ on your graphing calculator.

Step 2 ~

Use the Intersect feature to find the x-values at the points of intersection.

The solutions are:

Sum of Cubes:

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

Difference of Cubes:

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

Ex. 2: Factor each expression.

a) $x^3 - 125$

b) $8x^3 + 1$

Ex. 3: Solve the equation.

$$8x^3 + 125 = 0$$

Ex. 4: Factor each equation.

a) $x^4 - 6x^2 - 27$

b) $x^4 - 3x^2 - 10$

Ex. 5: Solve the equation.

$$x^4 - 4x^2 = 45$$