

## 2.3 Polynomial Equations

Example #1: Solve:

a)  $x^3 - 4x^2 + 3x = 0$

$$x(x^2 - 4x + 3) = 0$$

$$x(x-3)(x-1) = 0$$

So  $x = 0, 3$  or  $1$

c)  $8x^3 - 6x^2 - 3x + 1 = 0$

Using Factor theorem,  $(x-1)$  is a factor

$$\begin{array}{r|rrrr} -1 & 8 & -6 & -3 & 1 \\ & & -8 & -2 & 1 \\ \hline & 8 & 2 & -1 & 0 \end{array}$$

So  $8x^3 - 6x^2 - 3x + 1 = 0$

$$(x-1)(8x^2 + 2x - 1) = 0$$

$$(x-1)(2x+1)(4x-1) = 0$$

So  $x = 1, -\frac{1}{2}$  or  $\frac{1}{4}$

e)  $(x^2 - 9)(x^2 + 9) = 0$

$$(x-3)(x+3)(x^2+9) = 0$$

So  $x = 3$  or  $-3$

$$x^2 + 9 = 0$$

$$x^2 = -9$$

$$x = \sqrt{-9}$$

No solution  
in Real number  
System.

b)  $2x^3 + x^2 - 18x - 9 = 0$

$$x^2(2x+1) - 9(2x+1) = 0$$

$$(2x+1)(x^2-9) = 0$$

$$(2x+1)(x+3)(x-3) = 0$$

So  $x = -\frac{1}{2}, -3$  or  $3$

$4x^4 - 6x^2 - 2x - 4 = 0$

Use Technology Round to 2 decimal places

USING TI 83+

$x = -1.31$  or  $1.51$