

## Sec. 5.3 Solving Polynomial Equations

Problem 1:

What are the real or imaginary solutions of

$$a. \quad 4x^3 - 6x^2 = 4x$$

$$\quad \quad \quad -4x \quad -4x$$


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$$4x^3 - 6x^2 - 4x = 0$$

$$2x(2x^2 - 3x - 2) = 0 \quad \begin{array}{l} a \cdot c \\ -4 \end{array}$$

$$2x(2x^2 + 1x - 4x - 2) = 0 \quad \begin{array}{l} 1 \cdot 4 \\ 2 \cdot 2 \end{array}$$

$$2x[x(2x+1) - 2(2x+1)] = 0$$

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

$$\frac{2x}{2} = \frac{0}{2}$$

$$\boxed{x=0}$$

$$\frac{2x+1}{-1 \ -1} = \frac{0}{-1 \ -1}$$

$$\frac{2x}{2} = \frac{-1}{2}$$

$$\boxed{x = -\frac{1}{2}}$$

$$\frac{x-2}{+2 \ +2} = \frac{0}{+2 \ +2}$$

$$\boxed{x=2}$$

Problem 2:

$$\begin{array}{r} 2x^3 = -54 \\ +54 \quad +54 \\ \hline \end{array}$$

$$\frac{2x^3}{2} + \frac{54}{2} = \frac{0}{2}$$

$$x^3 + 27 = 0$$

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

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

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

$$\begin{array}{r} a^3 \quad (-) \quad a^2/b \quad (+) \quad ab^2 \\ (+) \quad a^2b \quad (-) \quad ab^2 \quad + b^3 \\ \hline a^3 + b^3 \end{array}$$