

Solving Polynomial Equations

$$x^3 + 7x^2 - 18x = 0$$

$$x(x^2 + 7x - 18) = 0$$

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

$$x=0 \quad x+9=0 \quad x-2=0$$

$$x=-9 \quad x=2$$

The highest power in a polynomial equation tells you how many answers you should get.

$$x^4 - 81 = 0$$

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

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

$$x^2+9=0 \quad x+3=0 \quad x-3=0$$

$$x^2 = -9 \quad x = -3 \quad x = 3$$

$$x = \pm 3i$$

$$x^3 + 3x^2 - 4x - 12 = 0$$

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

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

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

$$x+2=0 \quad x-2=0 \quad x+3=0$$

$$x = -2 \quad x = 2 \quad x = -3$$