

$$(3x-1)^3(x-2)^2 = 0 \quad 5^\circ \text{ grado}$$

$$(3x-1)(3x-1)(3x-1)(x-2)(x-2)$$

$$x = \frac{1}{3} \text{ tripla } \vee x = 2 \text{ doppia}$$

$$S = \left\{ \frac{1}{3} \text{ tripla}; 2 \text{ doppia} \right\}$$

$$(3x+1)^3 = (x-1)^2 \quad 3^\circ \text{ grado}$$

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

$$27x^3 + 1 + 9x + 27x^2 - (x^2 + 1 - 2x) = 0$$

$$27x^3 + 1 + 9x + 27x^2 - x^2 - 1 + 2x = 0$$

$$27x^3 + 26x^2 + 11x = 0$$

$$x(27x^2 + 26x + 11) = 0$$

$$\Delta = b^2 - 4ac = 676 - 1188 = -512$$

$$x = 0 \vee 27x^2 + 26x + 11 = 0$$

$$\downarrow \\ x = 0$$



$$x_{1,2} \notin \mathbb{R}$$

$$\Delta < 0$$

$$S = \{0\} \text{ e } 2 \text{ soluz. } \notin \mathbb{R}$$

$$16x^4 - 1 = 0 \quad 4^\circ \text{ grado}$$

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

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

$$2x-1=0 \vee 2x+1=0 \vee 4x^2+1=0$$

$$\Downarrow$$

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

$$\Downarrow$$

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

$$\Downarrow$$

$$4x^2 = -1 \quad x^2 = -\frac{1}{4}$$

$$x_{1,2} = \pm \sqrt{-\frac{1}{4}} \notin \mathbb{R}$$

$$S = \left\{ -\frac{1}{2}; \frac{1}{2} \right\} \text{ e } 2 \text{ soluz. } \notin \mathbb{R}$$

$$x^6 - 64 = 0$$

$$(x^3 - 8)(x^3 + 8) = 0$$

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

$$x - 2 = 0 \vee x^2 + 2x + 4 = 0 \vee x + 2 = 0 \vee x^2 - 2x + 4 = 0$$

$$\Downarrow \\ x = 2$$

$$\Downarrow \\ \Delta = b^2 - 4ac = \\ 4 - 16 = -12 \\ x_{1,2} \notin \mathbb{R}$$

$$\Downarrow \\ x = -2$$

$$\Downarrow \\ \Delta = 4 - 16 = -12 \\ x_{1,2} \notin \mathbb{R}$$

$$S = \{-2; 2\} \text{ e } 4 \text{ sol } \notin \mathbb{R}$$

$$x^4(2x + 1) = 18x^3 + 9x^2$$

5° grado

$$2x^5 + x^4 - 18x^3 - 9x^2 = 0$$

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

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

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

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

$$\Downarrow \\ x = 0 \text{ (doppia)} \vee x = -\frac{1}{2} \vee x = 3 \vee x = -3$$

$$S = \left\{ -3; -\frac{1}{2}; 0 \text{ (doppia)}; 3 \right\}$$