

6/12/2021

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$$\frac{2x-1}{4x^2+16x+15} + \frac{2}{2x+3} = \frac{x+4}{2x^2+9x+10}$$

$$4x^2+16x+15=0$$

$$\Delta = 256 - 240 = 16$$

$$x = \frac{-16 \pm 4}{8} = \begin{cases} -\frac{5}{2} \\ -\frac{3}{2} \end{cases}$$

$$4x^2+16x+15 = \overset{2 \cdot 2}{4} \left(x + \frac{5}{2}\right) \left(x + \frac{3}{2}\right) \\ = (2x+5)(2x+3)$$

$$2x^2+9x+10=0$$

$$\Delta = 81 - 80 = 1$$

$$x = \frac{-9 \pm 1}{4} = \begin{cases} -\frac{5}{2} \\ -2 \end{cases}$$

$$2x^2+9x+10 = 2 \left(x + \frac{5}{2}\right) (x+2) \\ = (2x+5)(x+2)$$

$$\frac{2x-1}{(2x+5)(2x+3)} + \frac{2}{2x+3} = \frac{x+4}{(2x+5)(x+2)}$$

C.E. $x \neq -\frac{5}{2}$

$x \neq -\frac{3}{2}$ $x \neq -2$

$$\frac{(2x-1)(x+2) + 2(2x+5)(x+2)}{(2x+5)(2x+3)(x+2)} = \frac{(x+4)(2x+3)}{(2x+5)(2x+3)(x+2)}$$

$$\cancel{2x^2} + 4x - x - 2 + 2(2x^2 + 4x + 5x + 10) = \cancel{2x^2} + 3x + 8x + 12$$

$$3x - 2 + 4x^2 + 18x + 20 = 11x + 12$$

$$4x^2 + 10x + 6 = 0$$

$$2x^2 + 5x + 3 = 0$$

$$\Delta = 25 - 24 = 1$$

$$x = \frac{-5 \pm 1}{4} = \begin{cases} -\frac{3}{2} \text{ N. Acc.} \\ -1 \end{cases}$$

$x = -1$

FORMULA RIDOTTA

$$ax^2 + bx + c = 0$$

$$a \neq 0$$



$$b \text{ PARI} \Rightarrow b = 2\beta$$

$$x = \frac{-\beta \pm \sqrt{\beta^2 - ac}}{a}$$

FORMULA RIDOTTA

$$\frac{\Delta}{4} = \beta^2 - ac = \begin{cases} > 0 & \text{2 SOL. DISTINTE} \\ = 0 & \text{2 SOL. COINC.} \\ < 0 & \text{NESSUNA SOL. REALE} \end{cases}$$

DIMOSTRAZIONE

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \stackrel{b=2\beta}{=} \frac{-2\beta \pm \sqrt{4\beta^2 - 4ac}}{2a} = \\ &= \frac{-2\beta \pm \sqrt{4(\beta^2 - ac)}}{2a} = \frac{-2\beta \pm 2\sqrt{\beta^2 - ac}}{2a} = \\ &= \frac{2(-\beta \pm \sqrt{\beta^2 - ac})}{2a} = \frac{-\beta \pm \sqrt{\beta^2 - ac}}{a} \end{aligned}$$

ESEMPLI

$$5x^2 - 4x - 1 = 0$$

$$\beta = -2 \quad (\text{metà di } b)$$

$$\frac{\Delta}{4} = \beta^2 - ac = (-2)^2 - 5 \cdot (-1) = 4 + 5 = 9$$

$$x = \frac{2 \pm \sqrt{9}}{5} = \frac{2 \pm 3}{5} = \begin{cases} -\frac{1}{5} \\ 1 \end{cases}$$

$$\boxed{x = -\frac{1}{5} \vee x = 1}$$

562

$$\frac{1}{2x^2 - 5x - 12} + \frac{1}{4x^2 + 4x - 3} = \frac{1}{2x + 3}$$
$$\frac{1}{(x-4)(2x+3)} + \frac{1}{(2x+3)(2x-1)}$$

C.E.

$$\begin{cases} x \neq -\frac{3}{2} \\ x \neq 4 \\ x \neq \frac{1}{2} \end{cases}$$

$$2x^2 - 5x - 12 = 2x^2 - 8x + 3x - 12 = 2x(x-4) + 3(x-4) =$$

$$p = -24 \quad -8, +3$$

$$s = -5$$

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

$$4x^2 + 4x - 3 = 4x^2 + 6x - 2x - 3 = 2x(2x+3) - (2x+3) =$$

$$p = -12 \quad +6, -2$$

$$s = 4$$

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

$$\frac{2x-1 + x-4}{(x-4)(2x+3)(2x-1)} = \frac{-(x-4)(2x-1)}{(x-4)(2x+3)(2x-1)}$$

$$3x - 5 = -2x^2 + x + 8x - 4$$

$$2x^2 - 6x - 1 = 0$$

$$\beta = -3$$

$$\frac{\Delta}{4} = 9 + 2 = 11$$

$$\boxed{x = \frac{3 \pm \sqrt{11}}{2}}$$

dopo controlli C.E.

$$153 \quad x^2 - 2\sqrt{3}x + 2 = 0$$

$$\beta = -\sqrt{3}$$

$$\frac{\Delta}{4} = \beta^2 - ac = 3 - 2 = 1$$

$$x = \frac{-\beta \pm \sqrt{\frac{\Delta}{4}}}{a} = \sqrt{3} \pm 1$$

$$151 \quad 4x^2 - 60x - 31 = 0$$

$$\beta = -30$$

$$\frac{\Delta}{4} = 900 + 124 = 1024 = 32^2$$

$$x = \frac{30 \pm 32}{4} = \begin{cases} -\frac{2}{4} = -\frac{1}{2} \\ \frac{62}{4} = \frac{31}{2} \end{cases}$$

$$x = -\frac{1}{2} \vee x = \frac{31}{2}$$

RAPPRESENTAZIONE GRAFICA

$$\text{DI } y = ax^2 + bx + c \quad (a \neq 0)$$

Il grafico di $y = ax^2 + bx + c$ con $a \neq 0$ è una PARABOLA con asse di simmetria parallelo all'asse y .

$$y = x^2 - 3x + 2$$

INTERSEZIONI CON

GLI ASSI:

$$\begin{cases} y = x^2 - 3x + 2 \\ y = 0 \quad (\text{asse } x) \end{cases}$$

⇓

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

$$\Delta = 9 - 8 = 1$$

$$x = \frac{3 \pm 1}{2} = \begin{cases} 1 \\ 2 \end{cases}$$

$$A(1, 0) \quad B(2, 0)$$

$$\begin{cases} y = x^2 - 3x + 2 \\ x = 0 \quad (\text{asse } y) \end{cases} \quad \begin{cases} y = 2 \\ x = 0 \end{cases} \quad C(0, 2)$$

$$\text{VERTICE DELLA PARABOLA } V\left(-\frac{b}{2a}, -\frac{\Delta}{4a}\right)$$

$$\text{Nel nostro caso } V\left(\frac{3}{2}, -\frac{1}{4}\right)$$

