

EQUAZIONI LOGARITMICHE

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$$\log_3(x^2 + 2x) = 1$$

[-3; 1]

C.E.

$$x^2 + 2x > 0$$

$$x(x+2) > 0$$

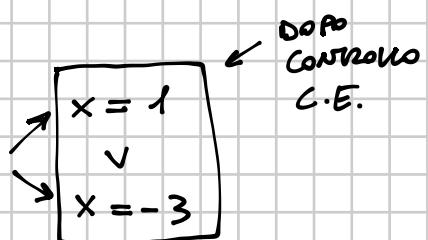
$$x < -2 \vee x > 0$$

$$\log_3(x^2 + 2x) = \log_3 3$$

$$x^2 + 2x = 3$$

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

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

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$$\log x - \log(x+1) = \log 2 - \log 5$$

 $\left[\frac{2}{3}\right]$

C.E.

$$\begin{cases} x > 0 \\ x+1 > 0 \end{cases} \quad \begin{cases} x > 0 \\ x > -1 \end{cases} \Rightarrow \boxed{x > 0}$$

$$\log \frac{x}{x+1} = \log \frac{2}{5}$$

$$\frac{x}{x+1} = \frac{2}{5}$$

$$5x = 2(x+1)$$

$$5x - 2x = 2$$

$$3x = 2 \Rightarrow$$

$$\boxed{x = \frac{2}{3}}$$

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$$\log_7(x-3) = \log_7(x^2 - 3x) \quad [\text{impossibile}]$$

$$\begin{cases} x-3 > 0 \\ x^2 - 3x > 0 \end{cases} \quad \begin{cases} x > 3 \\ x(x-3) > 0 \end{cases} \quad \begin{cases} x > 3 \\ x < 0 \vee x > 3 \end{cases} \Rightarrow x > 3 \quad C.E.$$

$$x-3 = x^2 - 3x$$

$$\begin{aligned} x^2 - 4x + 3 &= 0 \\ (x-3)(x-1) &= 0 \end{aligned}$$

$\nearrow x=1 \text{ N.A.}$
 $\searrow x=3 \text{ N.A.}$

EQ. IMPOSSIBILE

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$$\log_{\frac{1}{2}}(x^2 - 4x) + \log_2 2x - 1 = 0 \quad [5]$$

$$\log_{\frac{1}{2}}(x^2 - 4x) + \log_2 2x = 1$$

$$\frac{\log_2(x^2 - 4x)}{\log_2 \frac{1}{2}} + \log_2 2x = 1$$

$$\frac{\log_2(x^2 - 4x)}{-1} + \log_2 2x = 1$$

$$-\log_2(x^2 - 4x) + \log_2 2x = 1$$

$$\log_2 \frac{2x}{x^2 - 4x} = \log_2 2$$

$$\frac{2x}{x^2 - 4x} = 2 \Rightarrow x = x^2 - 4x$$

$$\begin{aligned} C.E. \quad &\begin{cases} x^2 - 4x > 0 \\ 2x > 0 \end{cases} \quad \begin{cases} x(x-4) > 0 \\ x > 0 \end{cases} \\ &\begin{cases} x < 0 \vee x > 4 \\ x > 0 \end{cases} \Rightarrow x > 4 \end{aligned}$$

$$\log_2 \frac{1}{2} = -1$$

$$\begin{aligned} x^2 - 5x &= 0 \\ x(x-5) &= 0 \end{aligned}$$

$$\begin{aligned} x &= 0 \\ &\text{N.A.} \end{aligned}$$

$$\boxed{x = 5}$$