13/12/2017

PAG. 434

44] $2^x = 8 \cdot \sqrt{2}$

$2^x = 2^3 \cdot 2^{\frac{1}{2}}$

$2^x = 2^{3+\frac{1}{2}}$

$x = 3 + \frac{1}{2} = \frac{7}{2}$

46] $3^x \cdot 27 = 9^{2x}$ ← $(3^2)^{2x}$

$3^x \cdot 3^3 = 3^{4x}$

$3^{x+3} = 3^{4x}$

$x + 3 = 4x$

$-3x = -3$

$x = 1$

49] $3 \cdot 4^x + \frac{7}{4} \cdot 4^x = 19\sqrt{2}$

$4^x \left(3 + \frac{7}{4}\right) = 19\sqrt{2}$

$4^x \cdot \frac{19}{4} = 19\sqrt{2}$

$\frac{4^x}{4} = \sqrt{2}$

$4^{x-1} = \sqrt{2}$

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

$2^{2(x-1)} = 2^{\frac{1}{2}}$ → $2x - 2 = \frac{1}{2}$

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

$\boxed{x = \frac{5}{4}}$

50]

$$5 \cdot 2^x + 2^{x-3} = 328$$

$$5 \cdot 2^x + 2^x \cdot 2^{-3} = 2^3 \cdot 41$$

$$2^x \left(5 + \underbrace{2^{-3}}_{\frac{1}{8}}\right) = 2^3 \cdot 41$$

328	2
164	2
82	2
41	

$328 = 2^3 \cdot 41$

$$2^x \cdot \frac{41}{8} = 2^3 \cdot 41$$

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

$2^{x-3} = 2^3 \Rightarrow x - 3 = 3 \Rightarrow x = 6$

oppure

ALTERNATIVA

$2^x = 2^3 \cdot 2^3 \Rightarrow 2^x = 2^6 \Rightarrow x = 6$

51

$$9^{x+2} = \sqrt[3]{3^{x+7}} \rightarrow 3^{\frac{x+7}{3}}$$

$$(3^2)^{x+2} = (3^{x+7})^{\frac{1}{3}}$$

$$3^{2(x+2)} = 3^{\frac{1}{3}(x+7)}$$

$$2(x+2) = \frac{1}{3}(x+7)$$

$$2x+4 = \frac{x+7}{3}$$

$$\frac{6x+12}{3} = \frac{x+7}{3}$$

$$5x = -5$$

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

pag 435

79]

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

$$3^{2x} - 2 \cdot 3^x - 3 = 0$$

$$(3^x)^2 - 2 \cdot 3^x - 3 = 0$$

$3^x = t$

$$t^2 - 2t - 3 = 0$$

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

$t = 3$ $\quad 3^x = 3 \Rightarrow \boxed{x = 1}$

v

$t = -1$ $\quad 3^x = -1$

IMPOSSIBILE

PERCHÉ $3^x > 0 \quad \forall x \in \mathbb{R}$

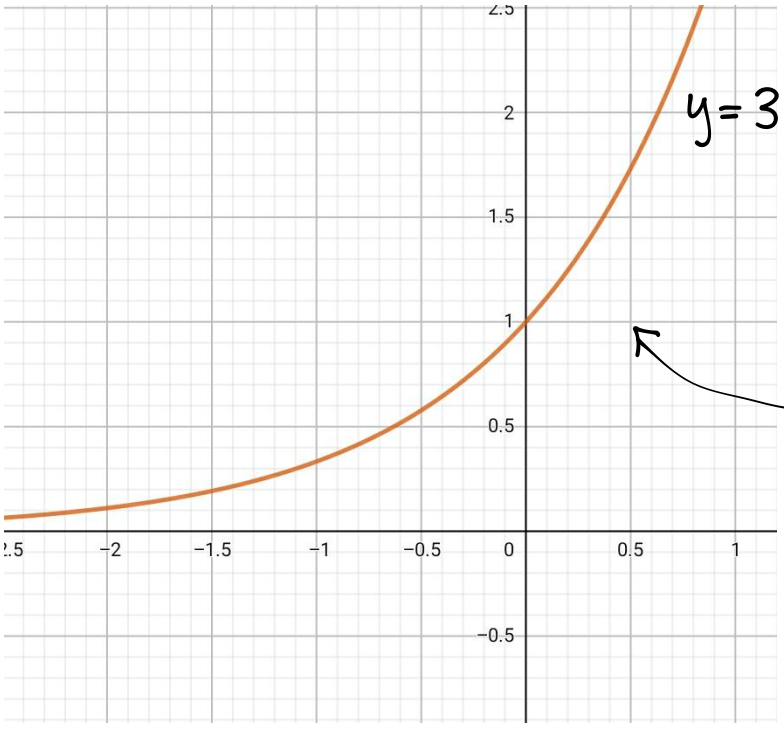

GRAFICO SEMPRE DALLA PARTE $y > 0$!!!

80]

$$3^{2x} - 9 \cdot 3^x + 3 = \frac{1}{3} \cdot 3^x$$

$t = 3^x$

$[t^2 = 3^{2x}]$

$$t^2 - 9t + 3 = \frac{1}{3} t$$

$$3t^2 - 27t + 9 = t$$

$$3t^2 - 28t + 9 = 0$$

$$\frac{\Delta}{4} = (-14)^2 - 3 \cdot 9 = 196 - 27 = 169 = 13^2$$

$$t = \frac{14 \pm 13}{3} = \begin{cases} \frac{1}{3} \Rightarrow 3^x = \frac{1}{3} \Rightarrow x = -1 \\ \frac{27}{3} = 9 \Rightarrow 3^x = 3^2 \Rightarrow x = 2 \end{cases}$$

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

96] $\frac{4}{2^x-1} + \frac{3}{2^x+1} = 5$

C.E.

1) $2^x - 1 \neq 0$

$2^x \neq 1$

$2^x \neq 2^0 \Rightarrow \boxed{x \neq 0}$

2) $2^x + 1 \neq 0$

$2^x \neq -1 \quad \forall x$

$2^x = t$

$\frac{4}{t-1} + \frac{3}{t+1} = 5$

$t^2 - 1$

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

$4t + 4 + 3t - 3 = 5t^2 - 5$

$5t^2 - 7t - 6 = 0$

$\Delta = 49 + 120 = 169 = 13^2$

$t = \frac{7 \pm 13}{10} = \begin{cases} -\frac{6}{10} = -\frac{3}{5} \text{ N.A.} \quad \left(2^x = -\frac{3}{5}\right) \\ \frac{20}{10} = 2 \end{cases}$

IMPOSSIBILE PERCHÉ $2^x > 0 \ \forall x$

$\frac{20}{10} = 2 \Rightarrow 2^x = 2 \Rightarrow \boxed{x = 1}$

DA CONFRONTARE CON C.E.