27/2/2018

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$$\log(2x^2+5x-3) - \log(x+3) = \log(4-x)$$

C.E.

$$\begin{cases} 2x^2+5x-3>0 \\ x+3>0 \to \\ 4-x>0 \to \end{cases} \boxed{\begin{matrix} x>-3 \\ x<4 \end{matrix}}$$

$$\downarrow$$

$$-3<x<4$$

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

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

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

$$2x^2+5x-3 = 4x+12-x^2-3x$$

$$3x^2+4x-15=0 \qquad \Delta = 16+180 = 196 = 14^2$$

$$x = \frac{-4\pm 14}{6} = \begin{cases} -3 & \text{N.A.} \\ \frac{5}{3} & \text{da controllare} \end{cases}$$

$$2\left(\frac{5}{3}\right)^2 + 5\cdot\frac{5}{3} - 3 \overset{?}{>} 0$$

$$\frac{50}{9} + \frac{25}{3} - 3 > 0 \quad \text{ok!}$$

$$\boxed{x = \frac{5}{3}}$$

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C.E. $x>0$

$$3\log^2 x - 2\log x = 0$$

$t = \log x$

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

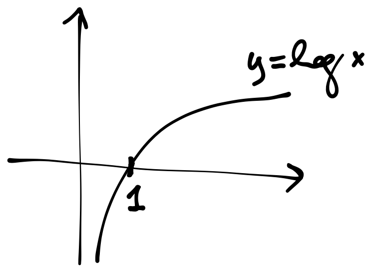
$$t(3t-2) = 0$$

$t = 0 \Rightarrow \log x = 0 \Rightarrow x = 1$

$t = \frac{2}{3} \Rightarrow \log x = \frac{2}{3}$

$$\Downarrow$$

$$x = 10^{\frac{2}{3}} = \sqrt[3]{100}$$



$$\boxed{x = 1 \quad \vee \quad x = \sqrt[3]{100}}$$

$\boxed{347}$

$$\log_2^2 x^2 + 4\log_2 \sqrt{x} - 2 = 0 \qquad \sqrt{x} \to x^{\frac{1}{2}}$$

C.E. $x>0$

$$\left[\log_2 x^2\right]^2 + \cancel{4}^{\,2} \cdot \frac{1}{\cancel{2}} \cdot \log_2 x - 2 = 0$$

$$\left[2\log_2 x\right]^2 + 2\log_2 x - 2 = 0$$

$\log_2 x = t$

$$[2t]^2 + 2t - 2 = 0$$

$$4t^2 + 2t - 2 = 0 \qquad 2t^2 + t - 1 = 0 \qquad \Delta = 1 + 8 = 9$$

$$t = \frac{-1 \pm 3}{4} = \begin{cases} -1 \\ \frac{1}{2} \end{cases}$$

$\log_2 x = -1$

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

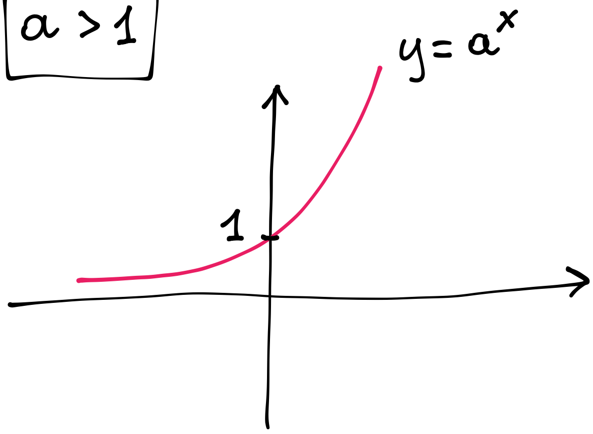
$\log_2 x = \frac{1}{2}$

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

$$\boxed{x = \frac{1}{2} \quad \vee \quad x = \sqrt{2}}$$

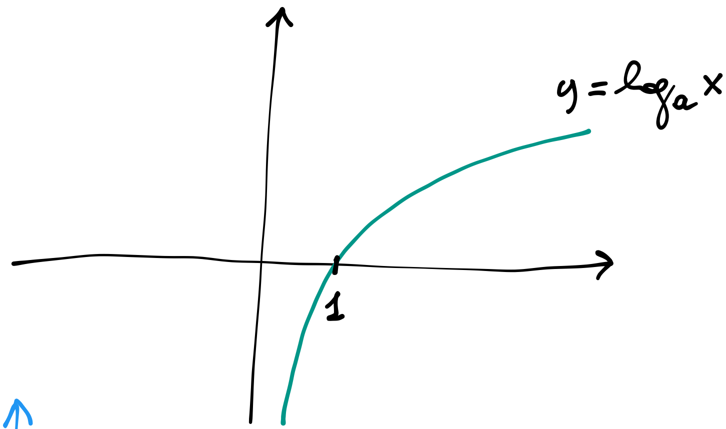
PUNTO DELLA SITUAZIONE

$\boxed{a > 1}$



$$\exp_a : \underbrace{\mathbb{R}}_{\text{DOMINIO}} \longrightarrow \underbrace{\mathbb{R}^+}_{\text{CODOMINIO}}$$

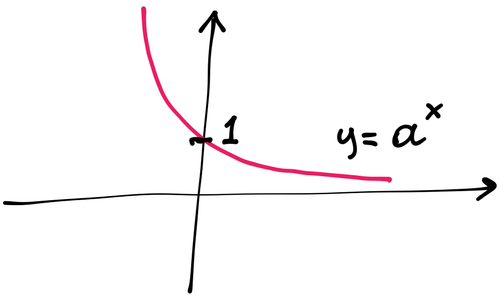
FUNZIONE ESPONENZIALE DI BASE a

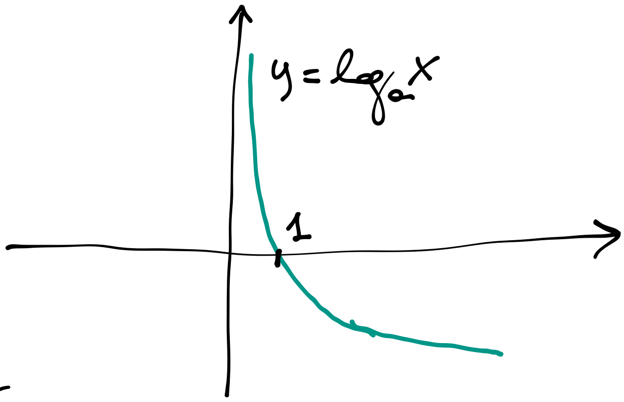


$$\log_a : \underbrace{\mathbb{R}^+}_{\text{DOMINIO}} \longrightarrow \underbrace{\mathbb{R}}_{\text{CODOMINIO}}$$

FUNZIONE LOGARITMICA IN BASE a

$\boxed{0 < a < 1}$





PROPRIETÀ

$$a^x \cdot a^y = a^{x+y}$$

$$a^x : a^y = a^{x-y}$$

$$(a^x)^y = a^{x \cdot y}$$

$\forall x, y > 0 \quad \log_a (x \cdot y) = \log_a x + \log_a y$

$\forall x, y > 0 \quad \log_a \frac{x}{y} = \log_a x - \log_a y$

$\forall x > 0 \quad \log_a x^m = m \log_a x$