

EQUAZIONI E DISEQUAZIONI ESPONENZIALI

$$a^x = b \quad a > 0$$

$$1) \quad 25^x = 125 \quad (5^2)^x = 5^3 \quad 5^{2x} = 5^3$$
$$2x = 3 \quad x = \frac{3}{2}$$

$$2) \quad \left(\frac{1}{2}\right)^{3x+7} = (16)^x \quad \left(\frac{1}{2}\right)^{3x+7} = \left[\left(\frac{1}{2}\right)^{-4}\right]^x$$

$$\left(\frac{1}{2}\right)^{3x+7} = \left(\frac{1}{2}\right)^{-4x}$$
$$3x+7 = -4x \quad x = -1$$
$$7x = -7$$

DISEQUAZIONI

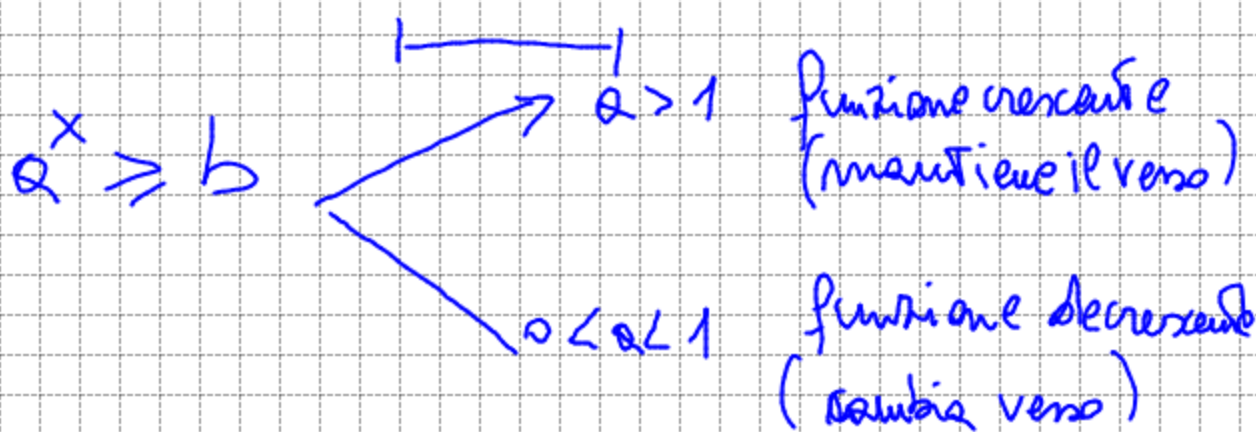
$$a^x > b, \quad a^x \geq b, \quad a^x < b, \quad a^x \leq b$$

ESEMPIO

• $32^x > 128$ $2^{5x} > 2^7$ (la base "2" è $> 1 \Rightarrow$ la corrispondente funzione esponenziale è crescente) $5x > 7$ $x > \frac{7}{5}$

• $\left(\frac{1}{8}\right)^x < \left(\frac{1}{2}\right)^2$ $\left(\frac{1}{2}\right)^{3x} < \left(\frac{1}{2}\right)^2$ (la base $\left(\frac{1}{2}\right)$ è < 1 quindi la corrispondente funzione esponenziale è decrescente)

$$3x > 2 \quad x > \frac{2}{3}$$



ES N 65 PAG 584

$$y = 2^{\sqrt{x-1}}$$
$$D_f = \{x \in \mathbb{R} / x-1 \geq 0\} = \{x \in \mathbb{R} / x \geq 1\} = [1, +\infty)$$

N110

$$\sqrt[3]{5^x} = \frac{1}{3125}$$

$$5^{\frac{x}{3}} = 5^{-5} \quad \frac{x}{3} = -5 \quad x = -15$$

N233

$$(0,01)^x - 7 \cdot (0,1)^x - 30 \geq 0$$

$$\left[\underbrace{(0,1)^x}_t \right]^2 - 7(0,1)^x - 30 \geq 0$$

range $t = 0,1^x$

$$t^2 - 7t - 30 \geq 0$$

$$t_{1,2} = \frac{7 \pm \sqrt{49 + 120}}{2} = \frac{7 \pm 13}{2} = \begin{cases} 10 \\ -3 \end{cases}$$

$$t \leq -3 \cup t \geq 10$$

~~$0,1^x \leq -3 \cup 0,1^x \geq 10$~~

$$(0,1)^x \geq (0,1)^{-1}$$

$$x \leq -1$$

$$0,1 = \frac{1}{10} = (10)^{-1} \quad (10^{-1})^x \geq 10$$

$$(10)^{-x} \geq (10)^1$$

$$-x \geq 1 \quad x \leq -1$$