17/1/2018

175]

$$\frac{3^x}{3^x-1}-\frac{1}{3^x+3}>1 \qquad 3^x=t$$

$$\frac{t}{t-1}-\frac{1}{t+3}-1>0$$

$$\frac{t(t+3)-(t-1)-\overbrace{(t-1)(t+3)}^{t^2+3t-t-3}}{(t-1)(t+3)}>0$$

$$\frac{\cancel{t^2}+\cancel{3t}-\cancel{t}+1-\cancel{t^2}-\cancel{3t}+\cancel{t}+3}{(t-1)(t+3)}>0$$

$$\frac{\overset{N]}{4}}{\underset{D_1]}{(t-1)}\underset{D_2]}{(t+3)}}>0$$

N] NON INFLUISCE

$D_1]$ $t-1>0 \Longrightarrow t>1$

$D_2]$ $t+3>0 \Longrightarrow t>-3$

		-3		1	
D_1	$-$		$-$	$\times$	$+$
D_2	$-$	$\times$	$+$		$+$
	$+$		$-$		$+$

$$t<-3 \quad \vee \quad t>1$$

$$\Downarrow$$

$$\underbrace{3^x<-3}_{\text{IMPOSSIBILE}} \quad \vee \quad 3^x>1$$

$$\Downarrow$$

$$3^x>3^0 \Longrightarrow \boxed{x>0}$$

IL PROBLEMA DI GIADA (UNO FRA I TANTI)

pg. 434 N 58

$$21 \cdot 3^x - 2^{x+3} = 3^{x+1}$$

$$21 \cdot 3^x - 3^{x+1} = 2^{x+3}$$

$$21 \cdot 3^x - 3^x \cdot 3 = 2^x \cdot 2^3$$

$$3^x(21-3) = 2^x \cdot 2^3$$

$$3^x \cdot 18 = 2^x \cdot 8$$

$$a \cdot b = c \cdot d$$

$$\Updownarrow$$

$$\frac{a}{c} = \frac{d}{b}$$

$$\frac{3^x}{2^x} = \frac{\cancel{8}\,4}{\cancel{18}\,9}$$

$$\left(\frac{3}{2}\right)^x = \frac{4}{9}$$

$$\left(\frac{3}{2}\right)^x = \left(\frac{3}{2}\right)^{-2} \rightarrow \boxed{x = -2}$$

59)

$$6 \cdot 3^{x+2} + 64 \cdot 2^{x-2} = 5 \cdot 3^{x+3}$$

$$6 \cdot 3^x \cdot 3^2 + 64 \cdot 2^x \cdot 2^{-2} = 5 \cdot 3^x \cdot 3^3$$

$$54 \cdot 3^x + 16 \cdot 2^x = 135 \cdot 3^x$$

$$16 \cdot 2^x = 135 \cdot 3^x - 54 \cdot 3^x$$

$$16 \cdot 2^x = 81 \cdot 3^x$$

$$\frac{2^x}{3^x} = \frac{81}{16} \Rightarrow \left(\frac{2}{3}\right)^x = \left(\frac{2}{3}\right)^{-4} \Rightarrow \boxed{x = -4}$$

pg. 437 n 147

$$\left(\frac{1}{5}\right)^{2x+1} < 625$$

$$\left(\frac{1}{5}\right)^{2x+1} < 5^4$$

$$\left(\frac{1}{5}\right)^{2x+1} < \left(\frac{1}{5}\right)^{-4} \qquad \text{siccome} \quad 0 < \frac{1}{5} < 1$$

$$\hookrightarrow \quad 2x+1 > -4$$

$$2x > -5$$

$$\boxed{x > -\frac{5}{2}}$$

OPPURE $\left(\frac{1}{5}\right)^{2x+1} < 5^4$ $\qquad$ $5^{-2x-1} < 5^4$

$$-2x-1 < 4$$

$$-2x < 5$$

$$\boxed{x > -\frac{5}{2}}$$