309 $\frac{4}{2^x-4}-\frac{2}{2^x-2}\leq 0$ $[1<x<2]$

$2^x=t$

$$\frac{4}{t-4}-\frac{2}{t-2}\leq 0$$

$$\frac{4(t-2)-2(t-4)}{(t-4)(t-2)}\leq 0$$

$$\frac{4t-\cancel{8}-2t+\cancel{8}}{(t-4)(t-2)}\leq 0$$

$$\frac{\cancel{2}t}{(t-4)(t-2)}\leq 0$$

perché $t=2^x>0$

$$\frac{\cancel{t}}{(t-4)(t-2)}\leq 0$$

$$\frac{1}{(t-4)(t-2)}\leq 0$$

$$2<t<4$$

$$2^1<2^x<2^2 \implies \boxed{1<x<2}$$

332 $\dfrac{8^{1+x}+8^{x}}{9} \geq 4^{1+2x}+\dfrac{16}{4^{1-2x}}$ $[x \leq -3]$

$$\frac{(2^3)^{1+x}+2^{3x}}{9} \geq (2^2)^{1+2x} + \frac{16}{(2^2)^{1-2x}}$$

$$\frac{2^{3+3x}+2^{3x}}{9} \geq 2^{2+4x} + \frac{16}{2^{2-4x}}$$

$$\frac{2^3\cdot 2^{3x}+2^{3x}}{9} \geq 2^{2+4x} + \frac{16}{2^{2-4x}}$$

$$\frac{2^{3x}\cancel{(2^3+1)}}{\cancel{9}} \geq 2^{2+4x} + \frac{16}{2^{2-4x}}$$

$$2^{3x} - 2^{2+4x} - \frac{16}{2^{2-4x}} \geq 0$$

$$\frac{2^{3x}\cdot 2^{2-4x} - 2^{2+4x}\cdot 2^{2-4x} - 16}{\cancel{2^{2-4x}}} \geq 0$$

$$2^{3x+2-4x} - 2^{2+\cancel{4x}+2-\cancel{4x}} - 16 \geq 0$$

$$2^{2-x} - 16 - 16 \geq 0 \qquad 2^{2-x} \geq 32$$

$$2^{2-x} \geq 2^5 \Rightarrow 2-x \geq 5 \qquad -x \geq 3 \qquad \boxed{x \leq -3}$$

334 $\dfrac{5}{3^x - 3} + \dfrac{2 \cdot 3^x}{3^x + 3} \geq \dfrac{18 - 2 \cdot 9^x}{9^x - 9}$

$[x \leq 0 \vee x > 1]$

$$\frac{5}{3^x - 3} + \frac{2 \cdot 3^x}{3^x + 3} \geq \frac{18 - 2 \cdot 3^{2x}}{\underset{(3^x)^2 - 3^2}{3^{2x} - 9}}$$

$t = 3^x$

$$\frac{5}{t-3} + \frac{2t}{t+3} - \frac{18 - 2t^2}{\underset{(t-3)(t+3)}{t^2 - 9}} \geq 0$$

$$\frac{5(t+3) + 2t(t-3) - 18 + 2t^2}{(t-3)(t+3)} \geq 0$$

$$\frac{5t + 15 + 2t^2 - 6t - 18 + 2t^2}{(t-3)(t+3)} \geq 0$$

$$\frac{4t^2 - t - 3}{(t-3)\underbrace{\cancel{(t+3)}}_{\text{sempre } > 0}} \geq 0 \qquad \frac{4t^2 - t - 3}{t-3} \geq 0$$

N] $4t^2 - t - 3 > 0$

$4t^2 - 4t + 3t - 3 > 0$

$4t(t-1) + 3(t-1) > 0$

$(t-1)\underbrace{\cancel{(4t+3)}}_{\text{perché sempre } > 0} > 0 \qquad t - 1 > 0 \quad t > 1$

D] $t - 3 > 0 \qquad t > 3$

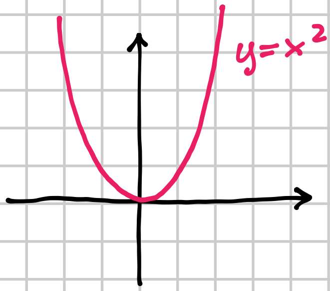
		1		3	
N	$-$	0	$+$		$+$
D	$-$		$-$	$\nexists$	$+$
	$+$	0	$-$	$\nexists$	$+$

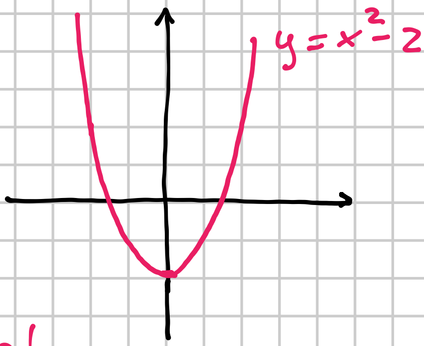
$t \leq 1 \quad \vee \quad t > 3$

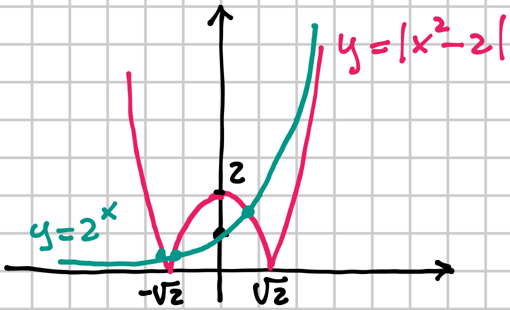
$3^x \leq 1 \quad \vee \quad 3^x > 3 \implies \boxed{x \leq 0 \quad \vee \quad x > 1}$

369 $2^x = |x^2 - 2|$ RISOLVERE GRAFICAMENTE

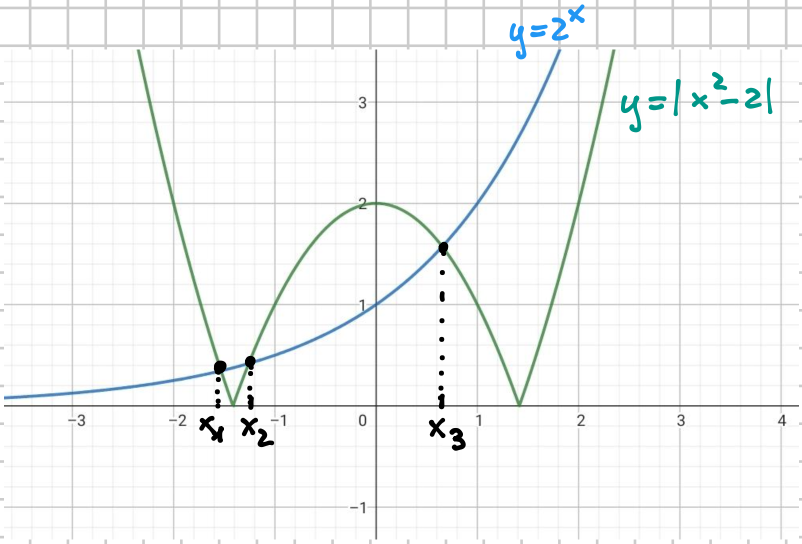
$$\begin{cases} y = 2^x \\ y = |x^2 - 2| \end{cases}$$







3 soluzioni x_1, x_2, x_3 $\quad -2 < x_1, x_2 < -1 \quad 0 < x_3 < 1$



Le ascisse dei punti di intersezione sono le soluzioni dell'equazione