205 $5^{x+2} - 4 \cdot 5^{1-x} - 30 = -5^{2-x}$ $[0; -1]$

$5^x \cdot 5^2 - 4 \cdot 5 \cdot 5^{-x} - 30 = -5^2 \cdot 5^{-x}$

$25 \cdot 5^x - 20 \cdot 5^{-x} - 30 = -25 \cdot 5^{-x}$

$25 \cdot 5^x - 20 \cdot 5^{-x} + 25 \cdot 5^{-x} - 30 = 0$

$25 \cdot 5^x + 5 \cdot 5^{-x} - 30 = 0$

$25 \cdot 5^x + \frac{5}{5^x} - 30 = 0$ $\qquad 5^x = t$

$25t + \frac{5}{t} - 30 = 0 \Rightarrow 5t + \frac{1}{t} - 6 = 0$

$\frac{5t^2 + 1 - 6t}{t} = 0$ $\qquad 5t^2 - 6t + 1 = 0$

$5t^2 - 5t - t + 1 = 0$

$5t(t-1) - (t-1) = 0$

$(t-1)(5t-1) = 0$

$t = 1 \quad \vee \quad t = \frac{1}{5}$

$5^x = 1 \quad \vee \quad 5^x = \frac{1}{5}$

$5^x = 5^0 \qquad 5^x = 5^{-1}$

$\boxed{x = 0 \quad \vee \quad x = -1}$

208 $\frac{2\cdot(3^x+1)}{3^x} = \frac{3\cdot(3^x+1)}{2\cdot 3^x+1}$ [impossibile]

$3^x = t$

$$\frac{2(t+1)}{t} = \frac{3(t+1)}{2t+1}$$ ← POSSO SEMPLIFICARE PERCHÉ $t+1 \neq 0$, ESSENDO $t = 3^x$

$$\frac{2}{t} = \frac{3}{2t+1}$$

$2(2t+1) = 3t$ $\quad 4t+2 = 3t$

$t = -2 \Rightarrow 3^x = -2$ IMPOSSIBILE

248 $\frac{5^{x+2}\cdot 25^{1-x}}{125^x} = \frac{1}{5}$ $\left[\frac{5}{4}\right]$

$$\frac{5^{x+2}\cdot(5^2)^{1-x}}{(5^3)^x} = \frac{1}{5}$$

$$\frac{5^{x+2}\cdot 5^{2-2x}}{5^{3x}} = \frac{1}{5}$$

$$5^{x+2+2-2x-3x} = 5^{-1}$$

$$5^{-4x+4} = 5^{-1}$$

$-4x+4 = -1$ $\quad -4x = -5$ $\quad \boxed{x = \frac{5}{4}}$

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$$\begin{cases} 3^x \cdot \sqrt{81^{x-y}} = 1 \\ 25^x \cdot \sqrt{125^y} = 5 \end{cases}$$

$$\left[\left(\frac{4}{17}; \frac{6}{17}\right)\right]$$

$$\begin{cases} 3^x \cdot \sqrt{(3^4)^{x-y}} = 1 \\ 5^{2x} \cdot \sqrt{5^{3y}} = 5 \end{cases} \qquad \begin{cases} 3^x \cdot 3^{\frac{2\cancel{4}(x-y)}{\cancel{2}}} = 1 \\ 5^{2x} \cdot 5^{\frac{3y}{2}} = 5 \end{cases}$$

$$\begin{cases} 3^{x+2(x-y)} = 1^{3^0} \\ 5^{2x+\frac{3}{2}y} = 5 \end{cases} \Rightarrow \begin{cases} x+2(x-y) = 0 \\ 2x+\frac{3}{2}y = 1 \end{cases} \qquad \begin{cases} x+2x-2y = 0 \\ 2x+\frac{3}{2}y = 1 \end{cases}$$

$$\begin{cases} 3x = 2y \\ 2x+\frac{3}{2}y = 1 \end{cases} \qquad \begin{cases} x = \frac{2}{3}y \\ \frac{4}{3}y+\frac{3}{2}y = 1 \end{cases} \qquad \frac{8y+9y}{\cancel{6}} = \frac{6}{\cancel{6}}$$

$$17y = 6 \Rightarrow y = \frac{6}{17}$$

$$\begin{cases} x = \frac{2}{\cancel{3}} \cdot \frac{\cancel{6}^2}{17} = \frac{4}{17} \\ y = \frac{6}{17} \end{cases}$$