① $\boxed{4^{4-x}\cdot 4^{x+7} = 4^{x^2-4x-10}}$ $\Rightarrow$ $4^{4-x+x+7} = 4^{x^2-4x-10}$ $\Rightarrow$ $4^{4+7} = 4^{x^2-4x-10}$ $\Rightarrow$

RICORDANDO

$a^m \cdot a^n = a^{m+n}$

$\Rightarrow$ POICHE' HANNO LA STESSA BASE, LE POTENZE SARANNO UGUALI SE HANNO LO STESS
ESPONENTE

$\Rightarrow$ $4+7 = x^2-4x-10$ $\Rightarrow$ $x^2-4x-10-4-7=0$ $\Rightarrow$ $x^2-4x-21=0$ $\quad a=1$, $b=-4$, $c=-21$

RICORDANDO LA FORMULA $x_{1,2} = \frac{-b\pm\sqrt{b^2-4ac}}{2a} = \frac{4\pm\sqrt{16-4(-21)}}{2} = \frac{4\pm\sqrt{16+84}}{2} = 4$

$= \frac{4+10}{2} = \frac{14}{2} = 7$

$= \frac{4-10}{2} = -\frac{6}{2} = -3$

SOLUZIONI $x_1 = 7$ e $x_2 = -3$

② $\boxed{\sqrt{7^{x+1}}\cdot 49^{x^2} = \frac{1}{7}}$

DA RICORDARE:

$\sqrt[n]{a^m} = a^{\frac{m}{n}}$ $\Rightarrow$ $\sqrt[2]{7^{x+1}} = 7^{\frac{x+1}{2}}$

$(a^m)^n = a^{m\cdot n}$ $\Rightarrow$ $49^{x^2} = (7^2)^{x^2} = 7^{2x^2}$

$a^{-m} = \left(\frac{1}{a}\right)^m$ $\Rightarrow$ $\frac{1}{7} = 7^{-1}$

TORNANDO ALLO SVOLGIMENTO DELL'ESERCIZIO SI HA (VEDI SOPRA)

$7^{\frac{x+1}{2}}\cdot(7^2)^{x^2} = 7^{-1}$ $\Rightarrow$ $7^{\frac{x+1}{2}}\cdot 7^{2x^2} = 7^{-1}$ (RICORDANDO CHE $a^m\cdot a^n = a$

$\Rightarrow$ $7^{\frac{x+1}{2}+2x^2} = 7^{-1}$ $\Rightarrow$ $7^{\frac{x+1+4x^2}{2}} = 7^{-1}$ $\Rightarrow$ $\frac{x+1+4x^2}{2} = -1$

$\Rightarrow$ $\frac{x+1+4x^2}{\cancel{2}} = \frac{-2}{\cancel{2}}$ $\Rightarrow$ $4x^2+x+1+2=0$ $\Rightarrow$ $4x^2+x+3=0$

$x_{1,2} = \frac{-b\pm\sqrt{b^2-4ac}}{2a} = \frac{-1\pm\sqrt{1-4(12)}}{8} = \frac{-1\pm\sqrt{1-48}}{8}$ POICHE' $\Delta < 0$

$\Rightarrow$ L'EQUAZIONE E' IMPOSSIBILE