

$$d) 5^{4x-1} - 5^{4x} - 5^{4x+1} + 5^{4x+2} = 480 \Rightarrow$$

$$\Rightarrow 5^{4x} \cdot 5^{-1} - 5^{4x} - 5^{4x} \cdot 5^1 + 5^{4x} \cdot 5^2 = 480$$

$$5^{4x} = K$$

$$K \cdot 5^{-1} - K - K \cdot 5^1 + K \cdot 25 = 480 \Rightarrow$$

$$\Rightarrow \frac{K}{5} - K - 5K + 25K = 480 \Rightarrow$$

$$\Rightarrow \frac{K}{5} + 19K = 480 \Rightarrow \cancel{5} \cdot \frac{K}{5} + 19K \cdot 5 = 480 \cdot 5$$

$$K + 95K = 2400$$

$$96K = 2400 \Rightarrow K = \frac{2400}{96} = 25$$

$$5^{4x} = 25 \Rightarrow$$

$$5^{4x} = 5^2 \Rightarrow 4x = 2 \Rightarrow x = \frac{2}{4} = \frac{1}{2} \Rightarrow \boxed{x = \frac{1}{2}}$$

### B64 - Indução

$$c) 4^x - 20 \cdot 2^x + 64 = 0 \Rightarrow (2^2)^x - 20 \cdot 2^x + 64 = 0$$

$$(2^x)^2 - 20 \cdot 2^x + 64 = 0 \Rightarrow y^2 - 20y + 64 = 0 \Rightarrow \Delta = (-20)^2 - 4 \cdot 1 \cdot 64$$

$$\Delta = 400 - 256 = 144$$

$$\Delta = 144 > 0 \quad (x_1 \neq x_2) \quad y = \frac{+20 \pm 12}{2} \quad \begin{matrix} y_1 = 16 \\ y_2 = 4 \end{matrix}$$

$$2^x = 16$$

$$2^x = 4$$

$$2^x = 2^4$$

$$2^x = 2^2$$

$$\boxed{x = 4}$$

$$\boxed{x = 2}$$