b) Veamos que $f_n(t)$ es de Cauchy. Sea $\varepsilon>0$ y $k\in\mathbb{N}$ tal que $2\left(\frac{3}{4}\right)^{\frac{k+1}{k}} \leq \varepsilon/2$. Se ve que $\forall n,m>k$:

Observemos que:

$$\|f_n(t)\| = \int_0^1 |f_n(t)|\,dt = \int_{\frac{1}{4}}^1 |(t-\tfrac{1}{4})^{1/n}|\,dt = \int_{1/4}^1 (t-\tfrac{1}{4})^{1/n}\,dt$$

$u = t-\frac{1}{4}$

$du = dt$

$$= \int_0^{3/4} u^{1/n}\,du = \frac{n}{n+1}\, u^{\frac{n+1}{n}}\Big|_0^{3/4} = \frac{n}{n+1}\left(\frac{3}{4}\right)^{\frac{n+1}{n}}$$

Luego: $\|u_n - u_k\| \leq \|u_n\| + \|u_m\|$

$$\leq \frac{n}{n+1}\left(\frac{3}{4}\right)^{\frac{n+1}{n}} + \frac{m}{m+1}\left(\frac{3}{4}\right)^{\frac{m+1}{m}} \leq \left(\frac{3}{4}\right)^{\frac{n+1}{n}} + \left(\frac{3}{4}\right)^{\frac{m+1}{m}}$$

$$\leq 2\left(\frac{3}{4}\right)^{\frac{k+1}{k}} \leq \frac{\varepsilon}{2} < \varepsilon.$$

Luego, $f_n(t)$ es de Cauchy. Sin embargo, converge a una función discontinua. Luego V no es de Banach.