Multiple Integration
Iteration of Double Integrals

Question
Calculate the given double integrals by iteration
$\iint_T \frac{xy}{1+x^4}\,dA$
With T being the triangle with vertices $(0,0)$, $(1,0)$ and $(1,1)$.
Answer

$$\begin{aligned} I &= \iint_T \frac{xy}{1+x^4}\,dA \\ &= \int_0^1 \frac{x}{1+x^4}\,dx \int_0^x y\,dy \\ &= \frac{1}{2}\int_0^1 \frac{x^3}{1+x^4}\,dx \\ &= \frac{1}{8}\ln(1+x^4)\Big|_0^1 = \frac{\ln 2}{8} \end{aligned}$$