Drafts for sharing

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Abstract

1 Topology

- In feuille 2.5 Exo 1, we should assume X is a Hausdorff space since this condition is used twice in the provided solution.

2 TIM discussion

- Define $v_1(t) := \varphi(t) + \int_0^t \psi(x)\mathrm{d}x$ and $v_2(t) := \varphi(t) + \int_t^0 \psi(x)\mathrm{d}x$, then $u(x,y) = v_1(x+y) + v_2(x-y)$. We have $\partial_{x^2} v_1(x+y) = \partial_{y^2} v_1(x+y) = v_1''(x+y)$ and $\partial_{y^2} v_2(x-y) = \partial_y(-\partial_y v_2'(x-y)) = v_2''(x-y) = \partial_{x^2} v_2(x-y)$