

MATH 3060 Tutorial 9

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1. Give examples of a sequence $\{f_n\}$ in $(C[0, 1], d_\infty)$ such that
 - (a) $\{f_n\}$ is uniformly bounded but not precompact.
 - (b) $f_n \rightarrow 0$ pointwise but $\{f_n\}$ is not precompact.

2. Let \mathcal{G} consist of all functions G on $[-1, 1]$ of the form

$$G(x) = \int_0^x \cos(1 + \phi(y)) dy,$$

where ϕ is a continuous on $[-1, 1]$. Show that \mathcal{G} forms a precompact set in $C[-1, 1]$.

3. $\{f_n\}$ is equicontinuous and converges pointwise on $[0, 1]$, show that f_n converges uniformly.