

MATH 3060 Tutorial 7

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1 Questions of this tutorials

1. True or False
 - (a) $f_n : [0, 1] \rightarrow \mathbb{R}$, $f_n(x) = x^n$ is equicontinuous.
 - (b) Any metric space with a finite number of elements is complete.
 - (c) The subset $\{\sin nx : n \in \mathbb{Z}_+\}$ of $C([0, 1])$ is precompact.
 - (d) Let $f : X \rightarrow Y$ be a continuous map between metric spaces, if $K \subset X$ is compact, then $f(K)$ is also compact.
 - (e) Let $f : X \rightarrow Y$ be a continuous map between metric spaces, if $K \subset X$ is precompact, then $f(K)$ is also precompact.
 - (f) Let $f : X \rightarrow Y$ be a continuous map between metric spaces, if $K \subset Y$ is compact, then $f^{-1}(K)$ is also compact.
2. Deduce the Picard-Lindelöf Theorem based on the ideas of perturbation of identity.