Homework Assignment 1

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Question 1

a.) Let $f_n(x) = x^n \in \mathcal{C}([0,1])$. Prove that $\{f_n\}$ has no convergent sub sequence in the norm of $\mathcal{C}([0,1])$

Proof. Claim: $\{f_n\}$ pointwise converges to the following function $f(x)$:

$$f(x) = \begin{cases} 0 & 0 \leq x < 1 \\ 1 & x = 1 \end{cases}$$

Proof. □

□

Question 2

Question 3

Question 4

Question 5