Morales

MA 538

Spring 2021

HOMEWORK 5

13. Using the $(\epsilon - \delta)$ definition, prove that $f(x) = \frac{1}{x+2}$ is continuous at $x = 1$. Make sure you explain how you get a δ for a given ϵ.

14. Let X, Y be topological spaces and let $f : X \to Y$ be continuous functions. Show that the mapping $h : X \times Y \to Y \times Y$ defined by $h(x, y) = (f(x), y)$ continuous.

15. Let $\{X_k\}_{k=1}^n$ be a family of topological spaces. Suppose $\prod_{k=1}^n X_k$ is second countable. Prove or disprove whether X_k is second countable for some $k \in \{1, ...n\}$.

DUE :SEPTEMBER 30, 2021