# Real Analysis 2, MATH 5220, Spring 2023

## Homework 12, Section 9.2. Open Sets, Closed Sets, and Convergent Sequences

Due Saturday, April 22, at 11:59 p.m.

**Write in complete sentences!!!** *Explain* what you are doing and convince me that you understand what you are doing and why. Justify all steps by quoting relevant results from the textbook, class notes, or hypotheses. Do not copy the work of others; **do your own work!!!**

**9.14.** Let $(X, \rho)$ be a metric space in which $\{u_n\} \to u$ and $\{v_n\} \to v$. Prove that $\{\rho(u_n, v_n)\} \to \rho(u, v)$.

**9.17.** Prove Proposition 9.7: Let $\rho$ and $\sigma$ be equivalent metrics on a nonempty set $X$. Then a subset of $X$ is open in the metric space $(X, \rho)$ if and only if it is open in the metric space $(X, \sigma)$.