## Complex Analysis 1, MATH 5510, Spring 2022 Homework 6, Sections II.4, II.5, and Lipschitz Functions Due Saturday, March 5

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 or hypotheses.

- II.4.4. Prove that the union of a finite number of compact sets is compact.
- **II.2.5(b)** Prove that if f and g are Lipschitz functions from X into  $\mathbb{C}$  then so is f + g. HINT: Let  $M = M_1 + M_2$ .
- **Lipschitz Theorem 4.** If  $f : X \to \Omega$  is Lipschitz on X then f is uniformly continuous on X. HINT: This follows from the definitions of Lipschitz and uniformly convergent by taking  $\delta = \varepsilon/M$ .