Exercise Abbott 4.3.9:

Exercise Supplemental 1: a) Show that a continuous function on all of $\mathbb{R}$ that equals zero on the rational numbers must be the zero function

b) Suppose f and g are two continuous functions on the real numbers. Is it true that if $f(q) = g(q)$ for all $q \in \mathbb{Q}$, then f and g are the same function?

Exercise Supplemental 2: Suppose $K \subseteq \mathbb{R}$ is compact. Show that there exists $x_M \in K$ such that $x_M \geq x$ for all $x \in K$. Then, with very little work, show that there exists $x_m \in K$ such that $x_m \leq x$ for all $x \in K$.

Exercise Abbott 4.3.7(a):

Exercise Abbott 4.4.6:

Exercise Abbott 4.4.9: