HW 2

Rudin, *Principles of Mathematical Analysis*: Chapter 2, Problems 2, 6, 9, 12, 22, 25.

**Remark for problems 22 and 25:**

- Let $X$ be a metric space and $E \subset X$. We say that $E$ is dense in $X$ if: for every open set $G \subset X$, $E \cap G$ is not empty.
- Let $X$ be a metric space and $\{V_{\alpha}\}$ an open covering of $X$ (that is, every $V_{\alpha}$ is open and $X \subset \cup_{\alpha} V_{\alpha}$). We say that $\{V_{\alpha}\}$ is a base of $X$ if for every open set $G \subset X$, there exists $\alpha_0$ such that $V_{\alpha_0} \subset G$. 