Problem 1 (10 Points) State and prove the Archimedean property of $\mathbb{R}$.

Problem 2 (5 Points) State the Heine-Borel theorem.

Problem 3 (10 Points) What is the cardinality of the power set of $\mathbb{N}$. Prove your answer.

Problem 4 (10 Points) Consider the following subset of $\mathbb{R}$ given by $\{1/N | N = 1, 2, 3, \ldots\}$. What are all the points of closure for this subset? What are all the accumulation points of this subset? Is this subset a closed set, an open set, both, or neither? Give the reason for your answer.