Homework 14 of Introduction to Analysis(II)

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1. Let $A_M = \{x \in E \mid f_M \text{ is discontinuous at } x\}$ and $A = \{x \in E \mid f \text{ is discontinuous at } x\}$. For any $M \in \mathbb{N}$, if x is a point that f_M is discontinuous at x, That means $f(x) \leq M$ and f is discontinuous at x. That is, $A_M \subseteq A$ for all M implies that $\cup A_m \subseteq A$.

   And for any $x \in A$, there exists a $N \in \mathbb{N}$ s.t. $f(x) < N$. Then, $x \in A_N$. Therefore, $A = \cup A_M$.

2.