Q3: We claim that there exists some $x \in \mathbb{R}$ satisfying $E \cap E + x = \emptyset$. Define the set $A = \{x : E \cap E + x = \emptyset\}$. It is sufficient to show that A is nowhere dense, i.e. A closed with empty interiour. First we claim that A^c is open. If $x \in A^c$, then $E \cap E + x$ is empty. If A^c were not empty then for all $\varepsilon > 0$, $B_\varepsilon(x)$ is not contained in A^c. Since this holds for all ε, we have that $x \notin A^c$. A contradiction. Finally it remains to show that the interiour of A is empty. If not then for some $x \in A$ and $\varepsilon > 0$, $B_{\varepsilon(x) \subset A}$. If y is such that $y \in E, E + x$, we have that $y - x \in E$ and so $(y - x - \varepsilon, y - x + \varepsilon) \subset E$. Therefore $m(E) > 0$. A contradiction. Since translation is a homeomorphism, we apply the previous result, with our homeomorphism being translation.