Question 1. [50 points] Define what it means for $A \leq_m B$ (i.e., give the definition of (recursive) many-one reductions). Note: Give the definition from our course slides (not some obscure, seemingly different definition that happens to capture the same relation).

Question 2. [50 points] Define what it means for $A \leq_m B$. Let $A = \{x110x \mid x \in HP\}$. Prove that $A$ is undecidable by explicitly giving a recursive many-one reduction from HP to $A$ (which includes of course arguing that the function you give is indeed a recursive many-one reduction from HP to $A$. Recall that HP = $\{x \mid x \in L(M_x)\}$ or, equivalently, $\{x \mid M_x \text{ on input } x \text{ accepts}\}$. (Of course, make sure to give a reduction from HP to $A$ and not the other way around.) Note: $x110x$ denotes $x$ followed by 110 followed by $x$, e.g., if $x$ is 1101 then $x110x$ is 11011101101.