1. Prove that a set $S$ (of integers) is r.e. (recursively enumerable) iff is the domain of a recursive function. (For this and the next problem is it OK to work Turing machines and/or with intuitive notions of computation, i.e., to invoke the Church-Turing thesis.)

2. Prove that a set $S$ (of integers) is r.e. iff is the range of a recursive function.

3. Prove that $Q$ does not prove $\forall x(0 + x = x)$. 