

Let  $w \in \Sigma^*$  be arbitrary. We need to define a function  $f$  such that  $w \in A$  iff  $f(w) \in B$ . In other words, we need to define a function  $f$  such that  $w \in A$  iff  $f(w) = f(w)^R$ .

I think the solution would be something like  $f(w) = ww^R$  if  $w \in A$  and  $ab$  if not. However, this doesn't feel like a proper solution at all. I hope someone knows a better way...

I have seen the solution  $f(w) = ww^R$  seen being proposed, but that would work only if  $A$  accepts every word in the alphabet.