

**1. (Hand in to David)**

Prove the following “Shrinking Lemma”.

Suppose  $A \subseteq \mathbb{R}$ ,  $f : A \rightarrow \mathbb{R}$ , and  $c$  is a cluster point of  $A$ . Let  $\rho > 0$ , let  $A_\rho = A \cap (c - \rho, c + \rho)$ , and let  $g$  be the restriction of  $f$  to  $A_\rho$ . Then  $c$  is a cluster point of  $A_\rho$ , and if  $\lim_{x \rightarrow c} g(x) = L$ , then  $\lim_{x \rightarrow c} f(x) = L$ .