

1. Prove that for any  $\epsilon > 0$  there exists a  $\delta > 0$  such that: if  $x$  is a real number and  $0 < x < \delta$ , then  $x^2 < \epsilon$ .

2. Let  $\beta$  be a real number. Prove that if  $\beta^3$  is irrational, then  $\beta$  is irrational.