Definition Let $f: \boldsymbol{S} \rightarrow \mathbb{R}$, $\boldsymbol{S} \subseteq \mathbb{R}$, be a function. The function f is ***continuous at*** x_0 if for any $\varepsilon > 0$, there exists $\delta > 0$ such that for any x, that $|x - x_0| < \delta$, $|f(x) - f(x_0)| < \varepsilon$. The function *f* is ***continuous*** if it is continuous at each $x \in \boldsymbol{S}$.

HW: Let $f: \boldsymbol{S} \rightarrow \mathbb{R}$, $\boldsymbol{S} \subseteq \mathbb{R}$, be a function that is continuous at x_0. Show that if $f(x_0) < c$, there exists there exists $\delta > 0$ such that for any x, that $|x - x_0| < \delta$,$f(x) < c$.