Q6b: We will argue by contrapositive. Suppose that $f^{-1}(-\infty, a)$ is not open. Then there exists some $x \in f^{-1}(-\infty, a)$ such that for all $\varepsilon > 0$, there is some $y \in M_\varepsilon(x)$ with $y \notin f^{-1}(-\infty, a)$. Thus define $\{y_k\}$ to be a decreasing sequence of such $y's$ which satisfy the previous condition and converge to x. Then we have that $\lim_{k\to\infty} y_k = x$, but $\limsup_{k\to\infty} f(y_k) \geq f(x)$, since they are not in the preimage they must be greater than a. Now suppose that $f^{-1}(-\infty, a)$ is open. Then for each x, for all $\varepsilon > 0$, we have that the set $f^{-1}(-\infty, f(x) + \varepsilon)$ is open. Since x is in this set, there must be some open ball around it. For all y in this ball, we have that $f(y) < f(x) + \varepsilon$. Since this is true for all ε, if we take a sequence $\{x_k\}$ converging up to x, we have that $\limsup_{k\to\infty} f(x_k) \leq f(x)$, as desired.