Assignment 10 - Metric Spaces, continuity

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1. Show that a function between metric spaces $f : X \to Y$ is continuous at $x \in X$ if and only if for every sequence (x_n) in X converging to x, $\big(f(x_n)\big)$ converges to $f(x)$.

2. Show that a function $f : X \to Y$ is continuous (i.e. continuous at all points of X) if and only if for every open subset $U \subset Y$, $f^{-1}(U)$ is an open subset of X.