Additional Problems Assignment 17

1. Consider $\mathbb{R}$ with the usual topology.
   (a) Prove that (a, b) is a connected subset of $\mathbb{R}$.
   (b) In class we showed that $(0, 1) \cup (2, 3)$ is not a connected subset. Explain where your proof does not work in this case.
2. Show by example that if $f : X \to Y$ is continuious and $B \subseteq Y$ is connected that $f^{-1}(B)$ need not be connected.