Exercise sheet 4

1. The Jordan curve theorem says that if $f : S^1 \to S^2$ is a continuous map which is a homemorphism onto its image, then $S^2 \setminus f(S^1)$ has two components (equivalently, $\tilde{H}_0(S^2 \setminus f(S^1)) = \mathbb{Z}$).

a) Prove that the Jordan curve theorem follows from the following, if $f : [0,1] \to S^2$ is a continuous map that is homeomorphic onto its image, then $\tilde{H}_0(S^2 \setminus f([0,1])) = 0$)