

Homework #7- Hand in no later than 2:41 p.m., Wednesday, June 7

1. Suppose $[a,b]$ is an interval of real numbers with the usual topology, and let $f : [a,b] \rightarrow \mathbf{R}$, the reals again with the usual topology, be continuous. Prove that if c is a real number between $f(a)$ and $f(b)$, then there is an $x \in [a,b]$ such that $f(x) = c$.

2. Suppose A is a connected subset of a topological space. For each of the following, if the set is always connected, prove it; if not, give a counterexample.

a) $c\bar{A}$

b) $\text{int } A$

c) $\text{Fr } A$

d) A'