HOMEWORK 7 **DIFFERENTIAL TOPOLOGY** **MTG 5932-02**

due Wednesday, November 26, 2008

1. Let C, U, and V be metric spaces; assume C is compact and fix $u_0 \in U$ and $v_0 \in V$. Let $f : C \times U \to V$ be a continuous map, and assume that for all $x \in C$, $f(x, u_0) = v_0$. Let $\epsilon > 0$ be given. Prove that there exists a $\delta > 0$ such that for all $x \in C$ and $u \in U$, if $d(u, u_0) < \delta$, then $d(f(x, u), v_0) < \epsilon$.

2. Do problems 13, 14, 15 on page 53 of Milnor. These problems might be a bit harder than usual; hence the slightly longer period of time I am giving you. I encourage you to get an early start so that if you get stuck, you can come to me (or your classmates) for hints. Please express your ideas as clearly as possible. If there are gaps in your solutions, you can still get some credit for them, but be clear about where the gaps are!