**MATH 446 – Homework 5**

(*due Monday 26 March 2012*)

**1.** [5 pts] Let $A$ and $B$ be well orderable sets. Prove that $(A \cup B)$ is well orderable.

**2.** [7 pts] Prove that for every set $A$ there is a well ordered set $V$ such that there is no surjection $\pi$ of $A$ onto $V$.

**3.** [8 pts] Prove that $WO(\mathbb{N})$ is uncountable.

**4.** [5 pts] Prove that if $A \leq_c B$ then $\chi(A) \leq_o \chi(B)$.

**5.** [5 pts] Let $U$ be a well ordered set. Prove that if $U \leq_c A$ then $U <_o \chi(A)$.

**NOTE:** Your solutions must include enough detail to justify your conclusions.