MATH 445 – Homework 8

(*due Wednesday 2 December 2009*)

1. [4 pts] Define K_0 by $K_0(0) = 1$, $K_0(n) = 0$ for all $n > 0$. Prove that K_0 is recursive.

2. [4 pts] Let $X \subseteq \bar{\mathbb{N}}$. Assume that X is recursive. Prove that $\neg X$ (= the complement of X) is recursive.

3. [4 pts] Let $X, Y \subseteq \bar{\mathbb{N}}$. Assume that X and Y are both recursive. Prove that $X \wedge Y$ $(= X \cap Y)$ is recursive.

4. [4 pts] Prove that the set Seq of all sequence numbers is recursive.

5. [4 pts] Show that the function $C(k, i)$ defined in Theorem 3.1(c) is recursive.

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