MATH 445 – Homework 8

(*due Friday 3 December 2010*)

1. [4 pts] Define the function p by $p(0) = 0$, $p(n) = n - 1$ for all $n > 0$. Prove that p is recursive. Do this directly, without using problem 2.

2. [4 pts] Define the binary function M as follows:

$M(k, l) = 0$ if $k < l$, $M(k, l) = (k - l)$ if $l \leq k$.

Prove that M is recursive.

3. [6 pts] Let G_1 and G_2 be recursive unary functions on $\mathbb{N}$. Define F by $F(n)$ equals the smaller of $G_1(n)$, $G_2(n)$. Prove that F is recursive.

4. [6 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.