Math 6010 - Assignment 5

Due February 20, 2019

(1) Show that the word problem for string rewriting systems is semi-decidable (An informal argument suffices).

(2) Show that the following are primitive recursive functions:

(a) monus $x \ominus y := \begin{cases} x - y & \text{if } x > y \\ 0 & \text{else} \end{cases}$

(b) $f(\bar{x}, y) := \prod_{z \leq y} g(\bar{x}, z)$ for every primitive recursive function g

(3) Show that the following are primitive recursive predicates:

(a) x divides y;

(b) x is prime.

(4) Complete the proof of the Majorization Lemma of the Ackermann function by showing the induction step for the recursion scheme.