Math 6010 - Assignment 5

Due February 22, 2021

(1) Show that the word problem for string rewriting systems is computably enumerable (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) $f(\bar{x}, y) := \sum_{z \leq y} g(\bar{x}, z)$ for every primitive recursive function g
(3) Show that the following are primitive recursive predicates:
   (a) x divides y;
   (b) x is prime.
(4) Let P be a k-ary primitive recursive predicate. Show that

$$f(\bar{x}, y) := \mu(t < y)\ P(\bar{x}, t)$$

is primitive recursive.