

Math 6010 - Assignment 5

Due September 30, 2015

- (20) Show that the word problem for string rewriting systems is semi-decidable (An informal argument suffices).
- (21) Show that the following are primitive recursive functions:
- (a) monus $x \dot{-} y := \begin{cases} x - y & \text{if } x > y \\ 0 & \text{else} \end{cases}$
 - (b) $f(\bar{x}, y) := \prod_{z \leq y} g(\bar{x}, z)$ for every primitive recursive function g
- (22) Show that the following are primitive recursive predicates:
- (a) x divides y ;
 - (b) x is prime.
- (23) Complete the proof of the Majorization Lemma of the Ackermann function by showing the induction step for the recursion scheme.
- (24) Complete the proof that every recursive function is Turing computable by showing the induction step for μ -recursion.