Homework 4

(return by Nov. 21)

Exercise 1 *Show that* $(\lambda xy.\ xyy)(\lambda xy.\ xyy)(\lambda xy.\ xyy)$ *does not have a normal form.*

Exercise 2 *List all reduction sequence for* $(\lambda x.x)((\lambda y.yy)a)$*. Which one is a normal order reduction.*

Exercise 3 *(a) Show that if* $(\lambda x : \sigma.M)N$ *has degree* n *and measure* $\langle n, 1\rangle$ *then* $M[N/x]$ *has no redex of degree greater than* $n - 1$*.*

(b) Show that for every term M *not in normal form there is some reduction* $M \to M'$ *such that the measure of* M' *is less than the measure of* M*.*

(c) Give an example of a term M *and a reduction* $M \to M'$ *such that the measure of* M' *is greater than the measure of* M*.*