

Homework #2

Due date: 15th February

Problem 1. Simplify the following λ -expressions.

a. $((((\lambda x.\lambda y.\lambda z.xz(yz))(\lambda x.\lambda y.x))(\lambda x.\lambda y.x))(\lambda x.\lambda y.x))$

b. $(\lambda x.(xy))(\lambda z.z)$

c. $((\lambda f.((\lambda g.((ff)g))(\lambda h.(kh))))(\lambda x.(\lambda y.y)))$

d. $(\lambda g.((\lambda f.((\lambda x.(f(xx)))(\lambda x.(f(xx))))g))$

e. If $S = ((\lambda x.\lambda y.\lambda z.xz(yz))$

$$K = (\lambda x.\lambda y.x)$$

$$I = (\lambda x.x)$$

Show that

(a) $I(SKK)(SKKK) = K$

(b) $SKK(IK) = K$

What is the value of the expression KKK ?