

Warmup Exercises Lambda Calculus (week 5, 11.12.2013)

Exercise 1

Write down for each item a term $F \in \Lambda$, with a minimal number of variables, satisfying:

$$(i) \quad Fx = x(xx)$$

$$(ii) \quad Fx = x!$$

$$(iii) \quad Fxy = yx$$

$$(iv) \quad Fx = yx$$

$$(v) \quad Fx = xFl.$$

Exercise 2 [Jan Willem Klop]

Let $Y = LLLLLLLLLLLLLLLLLLLLLLLLLLLLLL$, where

$$L = \lambda abcdefghijklmnopqrstuvwxyzr(\text{this is a fixed point combinator}).$$

Show that for all $F \in \Lambda$ one has $YF = F(YF)$.