ALUNO: ELIAN GUSTAVO CHORNY BABIRESKI

DISCIPLINA: PROGRAMAÇÃO FUNCIONAL

LISTA: λ-CÁLCULO

**a. (λx.x(λuλv.v)(λaλb.a))(λaλb.a)**

→ (λaλb.a)(λuλv.v)(λaλb.a)

→ (λb.(λuλv.v))(λaλb.a)

→ λuλv.v

≡ λxλy.y

≡ F

**b. (λxλyλwλu.x(y w)u)(λsλz.s(s z))(λaλb.a(a(a b)))**

→ (λyλwλu.(λsλz.s(s z))(y w)u)(λaλb.a(a(a b)))

→ λwλu.(λsλz.s(s z))((λaλb.a(a(a b)))w) u

→ λwλu.(λz.((λaλb.a(a(a b)))w)(((λaλb.a(a(a b)))w)z)) u

→ λwλu.((λaλb.a(a(a b)))w)(((λaλb.a(a(a b)))w)u)

→ λwλu.(λb.w(w(w b)))(((λaλb.a(a(a b)))w)u)

→ λwλu.w(w(w(((λaλb.a(a(a b)))w)u)))

→ λwλu.w(w(w((λb.w(w(w b)))u)))

→ λwλu.w(w(w(w(w(w u)))))

≡ λsλz.s(s(s(s(s(s z)))))

≡ 6

**c. (λnλfλx.n(λgλh.h(g f))(λu.x)(λw.w))(λsλz.s(s z))**

→ λfλx.(λsλz.s(s z))(λgλh.h(g f))(λu.x)(λw.w)

→ λfλx.(λz.(λgλh.h(g f))((λgλh.h(g f)) z))(λu.x)(λw.w)

→ λfλx.((λgλh.h(g f))((λgλh.h(g f))(λu.x)))(λw.w)

→ λfλx.(λh.h(((λgλh.h(g f))(λu.x))f))(λw.w)

→ λfλx.(λw.w)(((λgλh.h(g f))(λu.x))f)

→ λfλx.((λgλh.h(g f))(λu.x)) f

→ λfλx.(λh.h((λu.x) f)) f

→ λfλx.f ((λu.x) f)

→ λfλx.f x

≡ λsλz.s z

≡ 1