	LEO2_12
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	Questão 1
	a) K(K I (A \D)) (\Delta a)
<u> </u>	$(\widetilde{y}\widetilde{x}^{\overline{\lambda}})((\widetilde{y}\widetilde{x}^{\overline{\lambda}})((\widetilde{y}\widetilde{x}^{\overline{\lambda}})\overline{x})((\widetilde{y}\widetilde{x}^{\overline{\lambda}})\overline{x})((\widetilde{y}\widetilde{x}^{\overline{\lambda}})\overline{x}))((\widetilde{y}\widetilde{x}^{\overline{\lambda}})\overline{x})$
	Livre
	~ (λκ. λγ.κ)((λm.λn.m)(λο.ο)((λρ.pp)(λα.qq)))((λr.rr)a)
	β (λy ((λm. λn.m)(λο.ω) ((λρ.pp)(λq.qq))) ((λr.rr)a) M a
	$\frac{M}{B} \sim (ym \cdot \overline{yu \cdot w}) (yu \cdot \overline{u}) ((yb \cdot bb) (yd \cdot dd))$
	M 3 (yn.(yo.o))((yp.pp)(yq.qq))
	β > λο.ο
	forma normal: Xo.o
	Assíveis caminhos:
	1) = (yk yk k) ((yw·yv·w) (yo·o) ((yb·bb) (yd·dd))) ((yk·k)g)
	B (yk.yk.k)((yu. y0.0)((yb. pp)(yq.qq)))((yr.rr)a)
	M 3 B () K . W . K) (y 0 · O) ((y L · L L) 9)
	$\frac{\beta}{\beta} \sim (\lambda y. \lambda o. a) ((\lambda r. rr)a)$
	B > 20.0
	forma normal: 10.0

Continuação:
 2) => (\(\lambda\k.\lambda\y.\k)((\lambda\m.\lambda\n.\m)(\(\lambda\cdot\))(\(\lambda\p.\pp)(\lambda\q.qq)))((\(\lambda\r.\rr)a)\)
 β (λκ.λγ.κ)((λm.λn.m)(λρ.ο)((λq.qq)(λq.qq)))((λr.rr) a) m 3
β (λk.λy.k)((λm.λn.m)(λο.ο)((λq.qq)(λq.qq)))(22)
 $\frac{\omega}{\beta} = \frac{1}{\beta} \left(\frac{y^2}{2^{2}} \left(\frac{y^2}{2^{2}} \left(\frac{y^2}{2^{2}} \right) \left(\frac{y^2}{2^{2}} \right) \right) \left(\frac{y^2}{2^{2}} \right) \left(\frac{y^2}$
 - (λy (λn. λα. α) ((λq. qq)) (λα. qq))) (22)
$\frac{\beta}{\beta} > (\sqrt{\lambda} \sqrt{(\sqrt{20.0})} \sqrt{(\sqrt{29})}$
<u>β</u> → λο.ο
 forma normal: 10.0
 3) = (\(\lambda \kappa
^ω γγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγγ
B → (yk·yy·k) ((yw·yo·o) ((yb·bb) (yd·dd)) ((yb·bb) (yb·bb) (yd·dd)) ((yb·bb) (yb·bb) (yd·dd)) ((yb·bb) (yb·bb) (yd·dd)) ((yb·bb) (yb·bb) (yb
$\frac{\beta}{\beta} \sim (\gamma K. \sqrt{\lambda} / \gamma V. K) (\gamma 0.0) (99)$
-β (λγ. <u>λο.ο)(aa)</u>
<u>B</u> → λQ. Q
forma rormal: 10.0

	!
	12 (ds. db. ab) 41
	$(\overline{y}\overline{a},\overline{y}\overline{b},\overline{a}\overline{b})(\overline{y}\overline{x},\overline{x}\overline{x})(\overline{y}\overline{x},\overline{x})$
	N. N. N.
	~ ()V)) V()()
	$\sim (\lambda k. \lambda l. k l) (\lambda m. mm) (\lambda n. n)$
	B () ()
·	$\frac{\beta}{\beta} \sim (\lambda L \cdot (\lambda m \cdot m m) L) (\lambda n \cdot n)$
	a
	$\frac{\beta}{\beta} (\lambda m.mm)(\lambda n.n)$
	$\frac{\beta}{m} \sim (\lambda n \cdot n)(\lambda n \cdot n)$
	w 9
	$\frac{\beta}{\rho}$ $(\lambda n. n)$
	forma normal : An-n
	Possíveis caminhos:
	1) ~ (\lambda (\lambda k.\lambda L.KL)(\lambda mm)(\lambda n.n)
	8 () ()
	$\xrightarrow{\beta} (\lambda L.(\lambda m.mm)L)(\lambda n.n)$
	β
-	$\frac{\beta}{M} \circ (\lambda L \cdot LL)(\lambda n \cdot n)$
	$\beta > (\ln n)(\ln n)$
	$\xrightarrow{\beta}$ $(\lambda n.n)$
	forma mrmal: \land n

 c) SKK AY
(yx*yxy5*(x5)(x5))(yx*yx*x)(yx*yxx)(yx*xx)(yf*xxx)(yf*xxx)(yf*xxx)(yx*xxx)
 == 6()K.)L. /m. (km)(Lm))(/n. /o. n)(/p. /q.p)(/r.rr)(/s(/t.s(tt))(/u.s(uu)))
B (\l. \dm. ((\dm. \do. m)m)(\lm))(\do. \do. \do. \do. \do. \do. \do. \do.
 - (λm. ((λn. λα. n)m) ((λρ. λα. ρ)m)) (λr. rr) (λε(λt. ε(+t)) (λυ. ε(υυ))) M 3
B = ((\langle
B (((((((((((((((((((
β (λrr)(λs.(λt.s(tt))(λυ.s(υυ))) M a
^β → (λε.(λt.ε(tt))(λυ.ε(υυ)))(λε.(λt.ε(tt))(λυ.ε(υυ)))
-B = (\(\lambda \(\lambda \) \(
 Entra em looping, portanto não possui forma normal

 d) C (BB) 00
 (yx yx yx xx s) (yx yx ys x (x s)) (yx yx ys x (x s)) (yx yx yx x x x x x))
~ ()K. <u>Nr. hm. KLm) (()n. ho ho nlop))()q. hr. hs. q(rs))</u> ()t. hv. u(tto))(hv. hv. w(vv. w))
B ~ (\l. \lam. (\lam.
 Bo (Am. ((An so sp n(op))(sq sr ss q(rs)))(st su u (ttul) m)(sv. sw w (v v w))
 β ((λο. λο μρ. η(ορ)) (λη. λκ. λε q (rs)) (λt. λυ. υ(ttu)) (λν. λν. ν(ννν)) η
8 0 ((\do
- ((λρ (λq. λr. λε q (rs))(λt. λυ. υ (ttu))p))(λν. λν. ω (νν ω)) M 3
 Boll / Ag. Ar As a (rs)) ((At. Av. v (ttv)) (Av. Av. w (v v w)))
B ((Ar. As ((At. <u>Du. w(ttu)</u>)(Ax. Ano w(xx w)) (rs))
 - 8 - ((/r. /s (/ /v. // /w. w (/ v w)) (/v. /w. w (/ v w)) (/rs)) _ =
 B > ((Ar. As ((Au. u ((Au. w ((Av. Au. w (v v w))(Av. Au. w (v v w)) w) u) (rs))
 Entra em looping, portanto não tem forma normal.