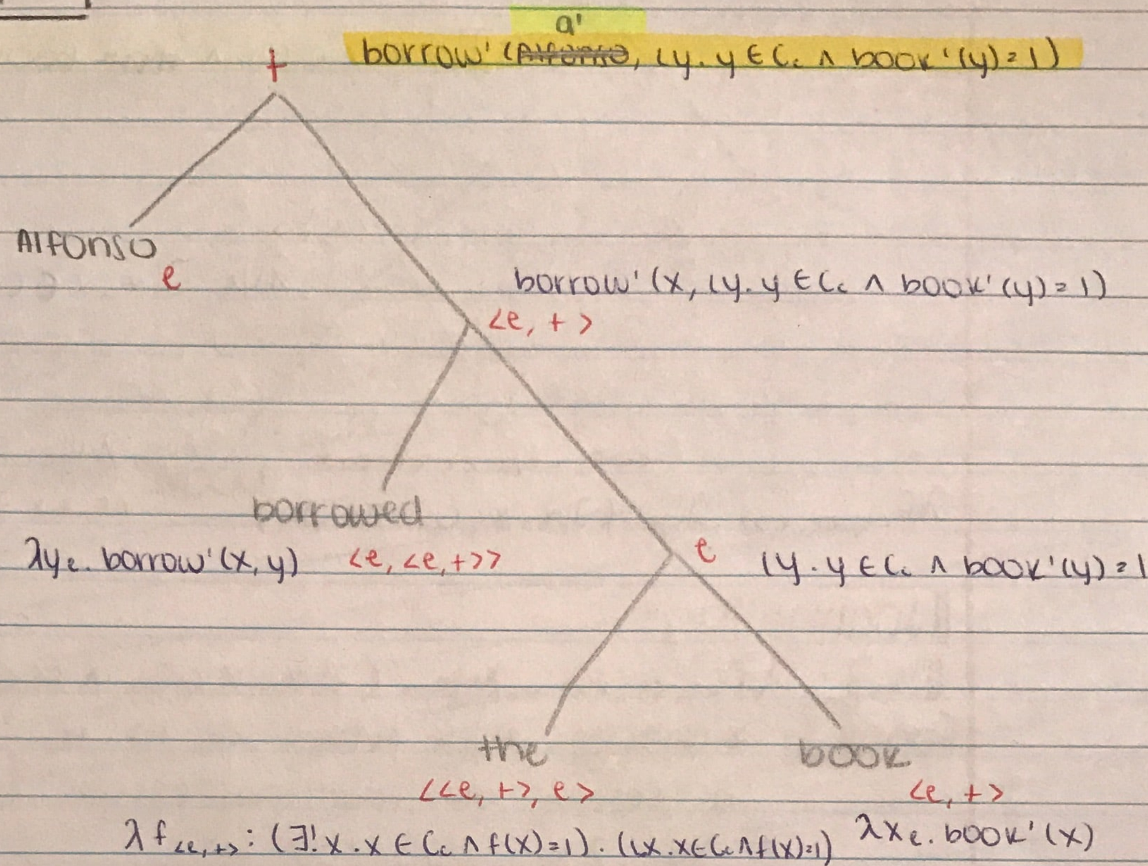
QUESTION 2
PART A



$[\![Alfonso]\!] = a'$

$[\![borrowed]\!] = \lambda y_e.borrow'(x,y)$

$[\![the]\!] = \lambda f_{\langle e,t\rangle}: (\exists! x.x \in C_c \wedge f(x)=1).(\iota x.x\in C_c \wedge f(x)=1)$

$[\![book]\!] = \lambda x_e.book'(x)$

$[\![the\ book]\!] = [\![the]\!]([\![book]\!])$

$= [\lambda f_{\langle e,t\rangle}: (\exists! x.x \in C_c \wedge f(x)=1).(\iota x.x\in C_c \wedge f(x)=1)](\lambda x_e.book'(x))$

$= \iota y.y \in C_c \wedge book'(y)=1$

$[\![borrowed\ the\ book]\!] = [\![borrowed]\!]([\![the\ book]\!])$

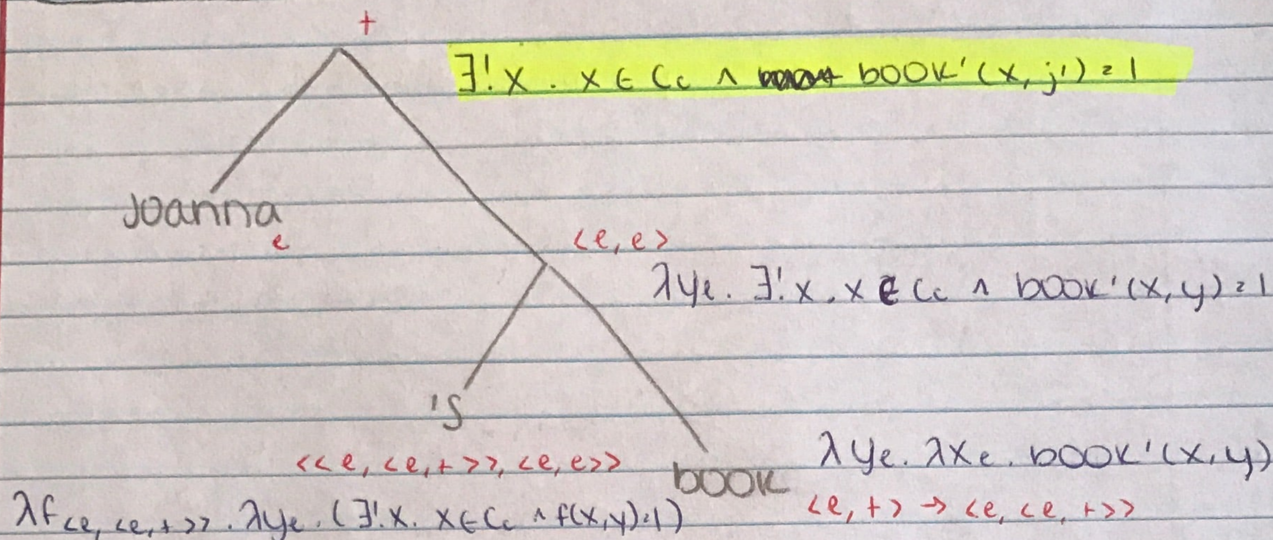
$= [\lambda y_e.borrow'(x,y)](\iota y.y\in C_c \wedge book'(y)=1)$

$= borrow'(x, \iota y.y \in C_c \wedge book'(y)=1)$

$[\![Alfonso\ borrowed\ the\ book]\!] = [\![borrowed\ the\ book]\!]([\![Alfonso]\!])$

$= borrow(a', \iota y.y\in C_c \wedge book'(y)=1)$

QUESTION 2
PART C



$[\![\text{Joanna}]\!] = j'$

$[\![\text{'s}]\!] = \lambda f_{<e,<e,t>>} . \lambda y_e . (\exists! x . x \in C_c \wedge f(x, y) = 1$

$[\![\text{book}]\!]$ * changes type from <e, t> to <e, <e, t>> as a result of the possessive construction

$= \lambda y_e \; \lambda x_e . book'(x, y)$

$[\![\text{'s book}]\!] = [\![\text{'s}]\!]([\![\text{book}]\!])$

$= [\lambda f_{<e,<e,t>>} . \lambda y_e . (\exists! x . x \in C_c \wedge f(x, y) = 1)](\lambda y_e . \lambda x_e . book'(x, y) = 1)$

$= \lambda y_e . \exists! x . x \in C_c \wedge book'(x, y) = 1$

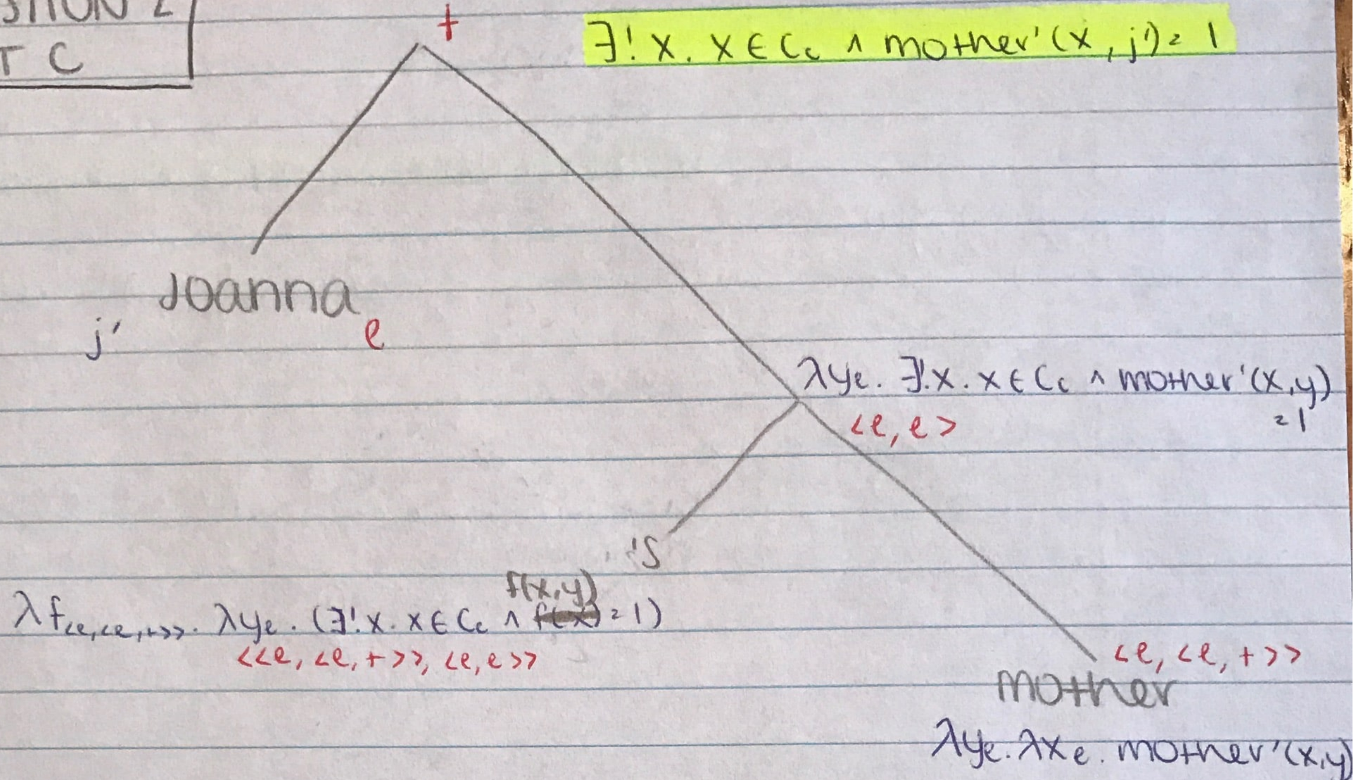
$[\![\text{Joanna's book}]\!] = [\![\text{'s book}]\!]([\![\text{Joanna}]\!])$

$= [\lambda y_e . \exists! x . x \in C_c \wedge book'(x, y) = 1](j')$

$= \exists! x . x \in C_c \wedge book'(x, j') = 1$

defined iff Joanna AND a book belonging to her exist

QUESTION 2
PART C



$[\![Joanna]\!] = j'$

possessee ↑ ↗ possessor

$[\![mother]\!] = \lambda y_e. \lambda x_e. mother'(x, y)$

$[\!['s]\!] = \lambda f_{<e,<e,t>>}. \lambda y_e. (\exists! x. x \in C_c \wedge f(x,y) = 1)$

$[\!['s\ mother]\!] = [\!['s]\!]([\![mother]\!])$

$= [\lambda f_{<e,<e,t>>}. \lambda y_e. (\exists! x. x \in C_c \wedge f(x,y) = 1)](\lambda y_e. \lambda x_e. mother'(x,y))$

$= \lambda y_e. \exists! x. x \in C_c \wedge mother'(x,y) = 1$

$[\![Joanna's\ mother]\!] = [\!['s\ mother]\!]([\![Joanna]\!])$

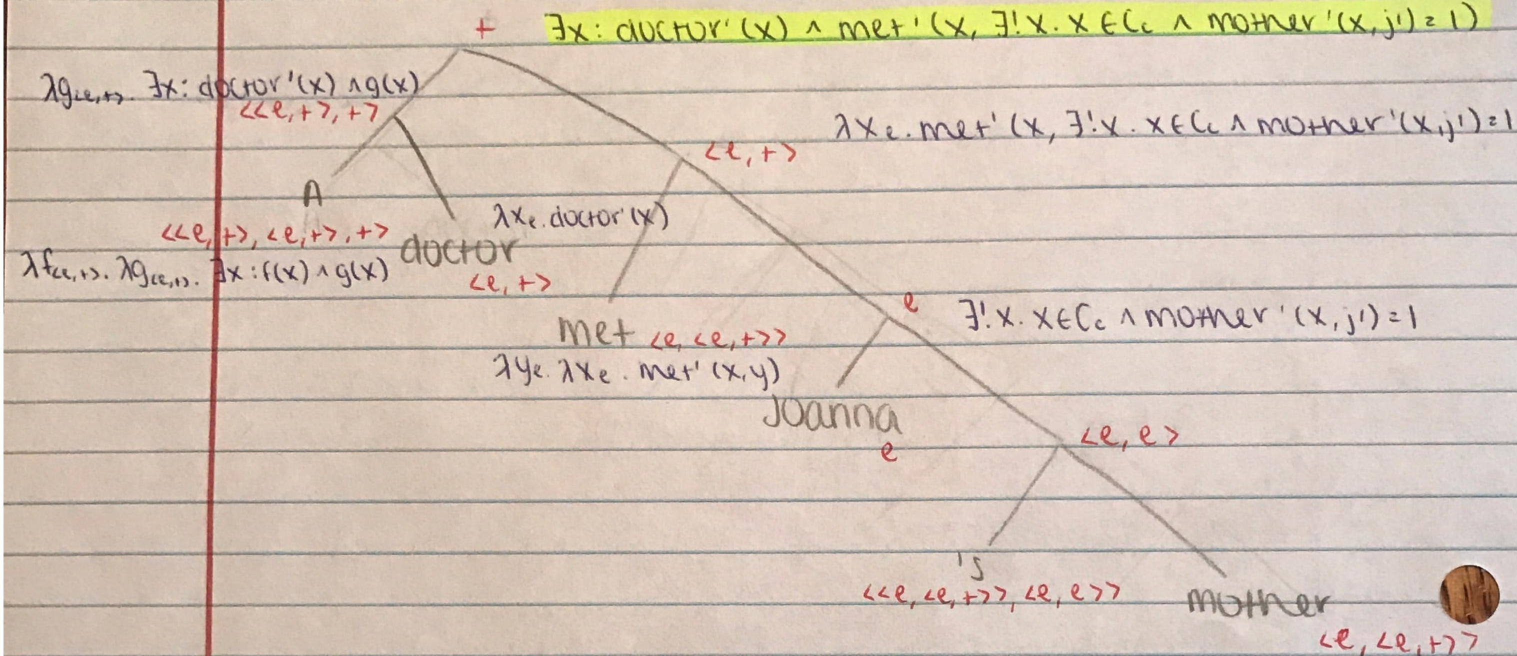
$= [\lambda y_e. \exists! x. x \in C_c \wedge mother'(x,y) = 1](j')$

$= \exists! x. x \in C_c \wedge mother'(x, j') = 1$

defined iff joanna AND her mother exist

QUESTION 2
PART E

"A doctor met Joanna's mother"



see part c for full derivation

$[\![\text{Joanna's mother}]\!] = \exists! x. x \in C_c \wedge mother'(x, j') = 1$

$[\![a]\!] = \lambda f_{<e,t>}. \lambda g_{<e,t>}. \exists x: f(x) \wedge g(x)$

$[\![doctor]\!] = \lambda x_e. doctor'(x)$

$[\![met]\!] = \lambda y_e. \lambda x_e. met'(x,y)$

$[\![\text{met Joanna's mother}]\!] = [\![met]\!]([\![\text{Joanna's mother}]\!])$

$= [\lambda y_e. \lambda x_e. met'(x,y)](\exists! x. x \in C_c \wedge mother'(x, j') = 1)$

$= \lambda x_e. met'(x, \exists! x. x \in C_c \wedge mother'(x, j') = 1)$

$[\![\text{a doctor}]\!] = [\![a]\!]([\![doctor]\!])$

$= [\lambda f_{<e,t>}. \lambda g_{<e,t>}. \exists x: f(x) \wedge g(x)](\lambda x_e. doctor'(x))$

$= \lambda g_{<e,t>}. \exists x: doctor'(x) \wedge g(x)$

$[\![\text{a doctor met Joanna's mother}]\!] = [\![\text{a doctor}]\!]([\![\text{met Joanna's mother}]\!])$

$= [\lambda g_{<e,t>}. \exists x: doctor'(x) \wedge g(x)](\lambda x_e. met'(x, \exists! x. x \in C_c \wedge mother'(x, j') = 1))$

$= \exists x: doctor'(x) \wedge met'(x, \exists! x. x \in C_c \wedge mother'(x, j') = 1)$

QUESTION 3
PART C

$\langle\langle e,t\rangle,t\rangle$ $\lambda g_{\langle e,t\rangle}.\, g(\iota x.\, \lambda y_e.\, fucking'(x,y) \wedge comp'(y)=1)=1$

the
$\langle\langle e,t\rangle,\langle e,t\rangle,t\rangle$
$\lambda f_{\langle e,t\rangle}: (\exists! x.\, x \in C_c \wedge f(x)=1).\, \lambda g_{\langle e,t\rangle}.\, g(\iota x_e.\, f(x)=1)=1$

$\langle e,t\rangle$ $\lambda y_e.\, fucking'(x,y) \wedge comp'(y)=1$

fucking
$\langle\langle e,t\rangle,\langle e,t\rangle\rangle$
$\lambda f_{\langle e,t\rangle}.\, \lambda y_e.\, fucking'(x,y) \wedge f(y)=1$

computer $\langle e,t\rangle$
$\lambda x_e.\, comp'(x)$

$[\![\text{the}]\!] = \lambda f_{\langle e,t\rangle}: (\exists! x.\, x \in C_c \wedge f(x)=1).\, \lambda g_{\langle e,t\rangle}.\, g(\iota x_e.\, f(x)=1)=1$
$[\![\text{computer}]\!] = \lambda x_e.\, comp'(x)$
$[\![\text{fucking}]\!] = \lambda f_{\langle e,t\rangle}.\, \lambda y_e.\, fucking'(x,y) \wedge f(y)=1$

$[\![\text{fucking computer}]\!] = [\![\text{fucking}]\!]([\![\text{computer}]\!])$
$= (\lambda f_{\langle e,t\rangle}.\, \lambda y_e.\, fucking'(x,y) \wedge f(y)=1)(\lambda x_e.\, comp'(x))$
$= \lambda y_e.\, fucking'(x,y) \wedge comp'(y)=1$

$[\![\text{the fucking computer}]\!] = [\![\text{the}]\!]([\![\text{fucking computer}]\!])$
$= [\lambda f_{\langle e,t\rangle}: (\exists! x.\, x \in C_c \wedge f(x)=1).\, \lambda g_{\langle e,t\rangle}.\, g(\iota x_e.\, f(x)=1)=1](\lambda y_e.\, fucking'(x,y) \wedge comp'(y)=1)$

$= \lambda g_{\langle e,t\rangle}.\, g(\iota x.\, \lambda y_e.\, fucking'(x,y) \wedge comp'(x)=1)=1$