NOTA AUXILIAR DE CLASE 01

Ejemplos de sustitución

*) $x,\ M \equiv x,\ N \equiv \lambda xy.x$

$$M[x:=N] \equiv x[x:=N]$$
$$\equiv N$$
$$\equiv \lambda xy.x$$

*) $x,\ M \equiv y \neq x,\ N \equiv \lambda xy.x$

$$M[x:=N] \equiv y[x:=N]$$
$$\equiv y$$

*) $x,\ M \equiv \lambda x.xy,\ N \equiv z$

$$M[x:=N] \equiv (\lambda x.xy)[x:=z]$$
$$\equiv M$$

$x,\ M \equiv \lambda x.xy,\ N \equiv \lambda xyz.(xz)(yz)$

$$M[x:=N] \equiv (\lambda x.xy)(x:=N)$$
$$\equiv \lambda x.xy$$
$$\equiv M$$

x, $M \equiv (\lambda x.xy)x$; $N \equiv z$

$M[x:=N] \equiv ((\lambda x.xy)x)[x:=z]$

$\equiv ((\lambda x.xy)[x:=z])(x[x:=z])$

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

*) x, $M \equiv \lambda y.xy$ $N \equiv z$

$x \neq y$, $y \notin FV(N) = \{z\}$

$M[x:=N] \equiv (\lambda y.xy)[x:=N]$

$\equiv \lambda y.(xy)[x:=z]$

$\equiv \lambda y.(x[x:=z])(y[x:=z])$

$\equiv \lambda y.zy$

z, $M \equiv \lambda y.xy$ $N \equiv y$

$y \neq z$, $z \notin FV(M)$

$$M[z := N] \equiv (\lambda y.\, xy)[z := y]$$

$$\equiv \lambda y.\, (xy)[z := y]$$

$z \notin FV(M)$

$$\equiv \lambda y.\, (x[z := y])(y[z := y])$$

$$\equiv \lambda y.\, (x\, y)$$

$$\equiv M$$