$t \; u_1 \dots u_n \overset{?}{=} r$

1) Γ, A. $\Gamma \vdash^{\wedge}_{\eta} r : A \;\wedge\; \forall r'.\ \Gamma \vdash^{\wedge}_{\eta} r' : A \Rightarrow r' = r$

subject exp.

$\Gamma \leq \Phi \quad A \leq \tau$!

2) $\Gamma \vdash^{\wedge}_{\eta} t\, u_1 \dots u_n : A$

$\underline{\Phi} \vdash r : \underline{\tau} \quad (\Phi, \tau)$ princ. pair.

$\Updownarrow$

$\Gamma \vdash^{\wedge}_{\eta} t : \varphi_1 \to \dots \varphi_n \to A$

$r = f(f(a))$ $\quad A = \gamma$

$\Phi = \{ f : \alpha \to \alpha,\ a : \alpha \}$

$\Gamma = \{ f : (\alpha \to \beta) \wedge (\beta \to \gamma) \quad a : \alpha \}$

subj red

3) $\Gamma \vdash^{\wedge}_{\eta} t' : \varphi_1 \to \dots \to \varphi_n \to A$

$t'\, u_1 \dots u_n \to\!\!\to r' \Rightarrow r = r'$

$\Gamma \leq \Phi$. $\varphi_1 \to \dots \to \varphi_n \to A \triangleq \sigma_1 \to \dots \to \sigma_n \to \tau \to \Phi \vdash t' : \sigma_1 \to \dots \to \sigma_n \to \tau$

$t' = \dots \underline{\lambda \overset{\omega}{x}. x x}$ $\quad u_n = \dots \underline{\lambda \overset{\omega}{x}. x x}$

why?

t' is in nf $\rightsquigarrow$ subformula property $\rightsquigarrow$ upper bound on size (t')

- what about multiple constraints?
- (what about inequalities / solution size?)

$\hookrightarrow$ given a solution t we have rhs for inequalities

$\rightsquigarrow$ transform t to t', preserving those rhs

multiple constraints: $\Gamma^1 \vdash^{\wedge}_{\eta} t : \varphi^1_1 \to \dots \to \varphi^1_n \to A^1$

$\vdots$

$\Gamma^m \vdash^{\wedge}_{\eta} t : \varphi^m_1 \to \dots \to \varphi^m_n \to A^m$