

$$\frac{p8}{t_{u1}; f f \text{ in } f f = 1 \text{ in } f f} [] \vdash []$$

$$t_{u1}; f f \vdash [t_{u1} \leftarrow \alpha. \alpha \vdash f] p$$

$$\frac{p1}{p x \rightarrow t_x, f \rightarrow t_x \vdash [\vdash] \vdash 1; \text{int}} t_{u1}; 1 \vdash [\vdash] \vdash 1; \text{int}$$

$$\frac{p2}{t_{u1} \leftarrow t_2 = t \rightarrow \text{int}} p \vdash f; t_2 \vdash [\vdash] \vdash 1; \text{int}$$

$$p(f) = \forall \alpha. \alpha \rightarrow \text{int}$$

$$\frac{p3}{p(f) = \forall \alpha. \alpha \rightarrow \text{int}} t_{u1} \leftarrow t_1 = t \rightarrow \text{int}$$

$p3$

$\underline{p4} \quad p[x \rightarrow tx] \in x : \text{int} \quad \underline{p1} \quad p[] \in 10 : \text{int}$
 $\underline{p5} \quad p[x \rightarrow tx] \in x < 10 : \text{bool} \quad \underline{p6}$
 $\underline{p3} \quad p[f \rightarrow tx \rightarrow tr] \in f : \text{int} \rightarrow \text{int} \quad \underline{p4} \quad p[x \rightarrow tx, f \rightarrow tx \rightarrow tr] \in f(x+1) : \text{int}$
 $\underline{p1} \quad p[x \rightarrow tx] \in x : \text{int} \quad \underline{p1} \quad p[] \in 1 : \text{int}$
 $\underline{p4} \quad p[x \rightarrow tx] \in x + 1 : \text{int}$

$p[x \rightarrow tx, f \rightarrow tx \rightarrow tr] \in \text{if } x < 10 \text{ then } 42 \text{ else } f(x+1) : \text{int}$

$\underline{p8} \quad p[] \in \text{let } f \, x = \text{if } x < 10 \text{ then } 42 \text{ else } f(x+1) \text{ in } f \, 20 \text{ end} : \text{int}$

$\underline{p3} \quad p[f \rightarrow A \, a1 . \text{int} \rightarrow a1] \in f : \text{int} \quad \underline{p1} \quad p[] \in 10 : \text{int}$
 $\underline{p9} \quad p[f \rightarrow A \, a1 . \text{int} \rightarrow a1] \in f \, 20 : \text{int}$