

$$\begin{array}{c}
\text{TInt} \frac{}{\Gamma \vdash n : \text{int}} \qquad \text{TVar} \frac{x : t \in \text{dom}(\Gamma)}{\Gamma \vdash x : t} \\
\\
\text{TFun} \frac{\Gamma, x : t \vdash e : t'}{\Gamma \vdash \lambda x : t. e : t \rightarrow t'} \qquad \text{TApp} \frac{\Gamma \vdash e_1 : t \rightarrow t' \quad \Gamma \vdash e_2 : t}{\Gamma \vdash e_1 e_2 : t'} \\
\\
\text{TApp} \frac{(*) D \vdash x z : \text{int} \rightarrow \text{int} \quad (**) D \vdash y z : \text{int}}{D \vdash x z (y z) : \text{int}} \\
\text{TFun} \frac{}{C \vdash \lambda z : \text{int}. x z (y z) : \text{int} \rightarrow \text{int}} \\
\text{TFun} \frac{}{B \vdash \lambda y : \text{int} \rightarrow \text{int}. \lambda z : \text{int}. x z (y z) : (\text{int} \rightarrow \text{int}) \rightarrow \text{int} \rightarrow \text{int}} \\
\text{T} \text{TFun} \frac{}{A \vdash \lambda x : \text{int} \rightarrow \text{int} \rightarrow \text{int}. \lambda y : \text{int} \rightarrow \text{int}. \lambda z : \text{int}. x z (y z) : (\text{int} \rightarrow \text{int} \rightarrow \text{int}) \rightarrow (\text{int} \rightarrow \text{int}) \rightarrow \text{int} \rightarrow \text{int}} \\
\\
(*) \text{TApp} \frac{\text{TVar} \frac{x : \text{int} \rightarrow \text{int} \rightarrow \text{int} \in \text{dom}(D)}{D \vdash x : \text{int} \rightarrow \text{int} \rightarrow \text{int}} \quad \text{TVar} \frac{z : \text{int} \in \text{dom}(D)}{D \vdash z : \text{int}}}{D \vdash x z : \text{int} \rightarrow \text{int}} \\
\\
(**) \text{TApp} \frac{\text{TVar} \frac{y : \text{int} \rightarrow \text{int} \in \text{dom}(D)}{D \vdash y : \text{int} \rightarrow \text{int}} \quad \text{TVar} \frac{z : \text{int} \in \text{dom}(D)}{D \vdash z : \text{int}}}{D \vdash y z : \text{int}}
\end{array}$$

Where $B = A, x : \text{int} \rightarrow \text{int} \rightarrow \text{int}$ and $C = B, y : \text{int} \rightarrow \text{int}$ and $D = C, z : \text{int}$