LAMBDA

MODULE LAMBDA

SYNTAX *Type* ::= `int`
| `bool`
| *Type* `->` *Type*
| (*Type*) [bracket]

SYNTAX *Exp* ::= *Id*
| `lambda` *Id* : *Type* `.` *Exp*
| *Exp* *Exp* [strict]
| (*Exp*) [bracket]

SYNTAX *Exp* ::= *Type*

SYNTAX *KResult* ::= *Type*

CONFIGURATION:

$$\left\langle \left\langle \$PGM : Exp \right\rangle_{\mathsf{k}} \left\langle \bullet_{Map} \right\rangle_{\mathsf{tenv}} \right\rangle_{\mathsf{T}}$$

SYNTAX *Exp* ::= *Exp* `->` *Exp* [strict]

RULE $\left\langle \dfrac{\texttt{lambda } X : T \texttt{ . } E}{(T \texttt{ -> } E) \curvearrowright \texttt{tenv}\ (\rho)} \cdots \right\rangle_{\mathsf{k}} \left\langle \dfrac{\rho}{\rho[T \texttt{ / } X]} \right\rangle_{\mathsf{tenv}}$

RULE $\left\langle \dfrac{X{:}Id}{T} \cdots \right\rangle_{\mathsf{k}} \left\langle \cdots X \mapsto T \cdots \right\rangle_{\mathsf{tenv}}$

RULE $\dfrac{(T1 \texttt{ -> } T2)\ \ T1}{T2}$

SYNTAX *Exp* ::= *Int*
| *Bool*
| *Exp* ∗ *Exp* [strict]
| *Exp* `/` *Exp* [strict]
| *Exp* `+` *Exp* [strict]
| *Exp* `<=` *Exp* [strict]

RULE $\dfrac{\text{—:Int}}{\texttt{int}}$

RULE $\dfrac{\text{—:Bool}}{\texttt{bool}}$

RULE $\dfrac{\texttt{int} * \texttt{int}}{\texttt{int}}$

RULE $\dfrac{\texttt{int / int}}{\texttt{int}}$

RULE $\dfrac{\texttt{int + int}}{\texttt{int}}$

RULE $\dfrac{\texttt{int <= int}}{\texttt{bool}}$

SYNTAX *Exp* ::= `if` *Exp* `then` *Exp* `else` *Exp* [strict]

RULE $\dfrac{\texttt{if bool then } T{:}Type \texttt{ else } T}{T}$

SYNTAX *Exp* ::= `let` *Id* : *Type* `=` *Exp* `in` *Exp*

RULE $\dfrac{\texttt{let } X : T \texttt{ = } E \texttt{ in } E'}{(\texttt{lambda } X : T \texttt{ . } E')\ \ E}$ [macro]

SYNTAX *Exp* ::= `letrec` *Id* : *Type* *Id* : *Type* `=` *Exp* `in` *Exp*
| `mu` *Id* : *Type* `.` *Exp*

RULE $\dfrac{\texttt{letrec } F : T1\ \ X : T2 \texttt{ = } E \texttt{ in } E'}{\texttt{let } F : T1 \texttt{ = mu } F : T1 \texttt{ . lambda } X : T2 \texttt{ . } E \texttt{ in } E'}$ [macro]

RULE $\left\langle \dfrac{\texttt{mu } X : T \texttt{ . } E}{(T \texttt{ -> } T)\ \ E \curvearrowright \texttt{tenv}\ (\rho)} \cdots \right\rangle_{\mathsf{k}} \left\langle \dfrac{\rho}{\rho[T \texttt{ / } X]} \right\rangle_{\mathsf{tenv}}$

SYNTAX *K* ::= `tenv` (*Map*)

RULE $\left\langle \text{—:Type} \curvearrowright \dfrac{\texttt{tenv}\ (\rho)}{\bullet_{K}} \cdots \right\rangle_{\mathsf{k}} \left\langle \dfrac{\text{—}}{\rho} \right\rangle_{\mathsf{tenv}}$

END MODULE