

# LAMBDA

MODULE LAMBDA

SYNTAX    *Exp* ::= *Int*  
          | *Bool*  
          | *Id*  
          | (*Exp*) [[binder](#)]  
          | *Exp* *Exp* [[strict](#)]  
          | *Exp* \* *Exp* [[strict](#)]  
          | *Exp* / *Exp* [[strict](#)]  
          | *Exp* + *Exp* [[strict](#)]  
          | *Exp* <= *Exp* [[strict](#)]  
          | **lambda** *Id* . *Exp* [[binder](#)]  
          | **if** *Exp* **then** *Exp* **else** *Exp* [[strict](#)]  
          | **let** *Id* = *Exp* **in** *Exp* [[binder](#)]  
          | **letrec** *Id* *Id* = *Exp* **in** *Exp* [[binder](#)]  
          | **mu** *Id* . *Exp* [[binder](#)]

SYNTAX    *Type* ::= **int**  
          | **bool**  
          | *Type* -> *Type*  
          | (*Type*) [[binder](#)]

SYNTAX    *Exp* ::= *Type*

SYNTAX    *Variable* ::= *Id*

SYNTAX    *KResult* ::= *Type*

CONFIGURATION:



RULE     $\frac{I: Int}{\text{int}}$

RULE     $\frac{B: Bool}{\text{bool}}$

RULE     $\frac{T1: Type * T2: Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE     $\frac{T1: Type / T2: Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE     $\frac{T1: Type + T2: Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE     $\frac{T1: Type <= T2: Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{bool}}$

RULE     $\frac{\text{lambda } X . E: Exp}{E[T / X] \curvearrowright T: Type \rightarrow \square}$

RULE     $\frac{T2: Type \curvearrowright T1: Type \rightarrow \square}{T1 \rightarrow T2}$

RULE     $\frac{T1: Type \quad T2: Type}{T1 = (T2 \rightarrow T: Type) \curvearrowright T}$

RULE     $\frac{\text{if } T: Type \text{ then } T1: Type \text{ else } T2: Type}{T = \text{bool} \curvearrowright T1 = T2 \curvearrowright T1}$

RULE     $\frac{\text{let } X = E \text{ in } E'}{(\text{lambda } X . E') \ E}$  [\[macro\]](#)

RULE     $\frac{\text{letrec } F \ X = E \text{ in } E'}{\text{let } F = \text{mu } F . \text{lambda } X . E \text{ in } E'}$  [\[macro\]](#)

RULE     $\frac{\text{mu } X . E}{(T: Type \rightarrow T) \ (E[T / X])}$

SYNTAX    *KItem* ::= *Type* = *Type*

RULE     $\frac{T = T}{\bullet_K}$

END MODULE