

Returned: Integer

Principle types:

a: $[(\text{int}), (\text{int} \rightarrow \text{int}), (\text{int} \rightarrow \text{int}), (\text{int} \rightarrow \text{int}), (\text{int} \rightarrow \text{int})] \rightarrow \text{int}$

b: $() \rightarrow \text{int}$

c: $(\text{int}) \rightarrow \text{int}$

Types proof using type checking

$$\frac{\begin{array}{c} R_{\text{int}} \frac{\overline{10 : \text{int}}}{\text{let } k = 10 \text{ in } k > 0 : \text{int}} \\ R_{>} \frac{\text{let } k = 10 \text{ in } k > 0 : \text{int}}{(k > 0) : \text{bool}} \end{array} \quad \begin{array}{c} R_{\text{gen}} \frac{\frac{R_{\text{gen}} \frac{\cdot \vdash x3 : \text{int}}{\forall \alpha. x3 : \text{int}} R_{\text{gen}} \frac{\cdot \vdash x3 : \text{int}}{\forall \alpha. x4 : \text{int}}}{\cdot, x3 : \text{int}, x4 : \text{int} \vdash b : \text{int}}} \\ R_{+} \frac{\cdot, x3 : \text{int}, x4 : \text{int} \vdash b : \text{int}}{\forall \alpha. b : \text{int}} \end{array} \quad \begin{array}{c} R_{\text{gen}} \frac{\cdot \vdash x3 : \text{int}}{\forall \alpha. x3 : \text{int}} R_{\text{gen}} \frac{\cdot \vdash x3 : \text{int}}{\forall \alpha. x4 : \text{int}} \\ R_{+} \frac{\forall \alpha. x3 : \text{int} \quad \forall \alpha. x4 : \text{int}}{x3 + x4 : \text{int}} \end{array}}{R_{\text{cond}} \cdot \vdash \text{if } (k > 0) \text{ then } b \text{ else } x3 + x4 : \text{int}}$$