

$$\begin{array}{c}
\frac{}{\Gamma \vdash \text{true} : \text{bool}} \quad \frac{}{\Gamma \vdash \text{false} : \text{bool}} \quad \frac{n \text{ は整数}}{\Gamma \vdash n : \text{int}} \\
\\
\frac{\Gamma \vdash e_1 : \text{int} \quad \Gamma \vdash e_2 : \text{int}}{\Gamma \vdash e_1 + e_2 : \text{int}} \quad \frac{\Gamma \vdash e_1 : \text{int} \quad \Gamma \vdash e_2 : \text{int}}{\Gamma \vdash e_1 - e_2 : \text{int}} \\
\\
\frac{\Gamma \vdash e_1 : \text{int} \quad \Gamma \vdash e_2 : \text{int}}{\Gamma \vdash e_1 * e_2 : \text{int}} \quad \frac{\Gamma \vdash e_1 : \text{int} \quad \Gamma \vdash e_2 : \text{int}}{\Gamma \vdash e_1 / e_2 : \text{int}} \\
\\
\frac{\Gamma \vdash e_1 : \tau \quad \Gamma \vdash e_2 : \tau}{\Gamma \vdash e_1 = e_2 : \text{bool}} \quad \frac{\Gamma \vdash e_1 : \tau_1 \quad \Gamma \vdash e_2 : \tau_2}{\Gamma \vdash (e_1, e_2) : \tau_1 * \tau_2} \quad \frac{\Gamma \vdash e_1 : \tau \quad \Gamma \vdash e_2 : \tau \text{ list}}{\Gamma \vdash e_1 :: e_2 : \tau \text{ list}} \\
\\
\frac{\Gamma \vdash e_1 : \text{bool} \quad \Gamma \vdash e_2 : \tau \quad \Gamma \vdash e_3 : \tau}{\Gamma \vdash \text{if } e_1 \text{ then } e_2 \text{ else } e_3 : \tau} \quad \frac{\Gamma, x : \tau_1 \vdash e : \tau_2}{\Gamma \vdash \text{fun } x \rightarrow e : \tau_1 \rightarrow \tau_2} \quad \frac{\Gamma \vdash e_1 : \tau \rightarrow \tau' \quad \Gamma \vdash e_2 : \tau}{\Gamma \vdash e_1 e_2 : \tau'} \\
\\
\frac{\Gamma \vdash e_1 : \tau_1 \quad \alpha_1 \dots \alpha_n \equiv FV_{\Gamma}(\tau_1) \quad \Gamma, x : \forall \alpha_1 \dots \alpha_n. \tau_1 \vdash e_2 : \tau_2}{\Gamma \vdash \text{let } x = e_1 \text{ in } e_2 : \tau_2} \\
\\
\frac{\Gamma, x : \tau_1 \vdash e_1 : \tau_1 \quad \alpha_1 \dots \alpha_n \equiv FV_{\Gamma}(\tau_1) \quad \Gamma, x : \forall \alpha_1 \dots \alpha_n. \tau_1 \vdash e_2 : \tau_2}{\Gamma \vdash \text{let rec } x = e_1 \text{ in } e_2 : \tau_2} \\
\\
\frac{\tau \equiv \Gamma(x)}{\Gamma \vdash x : \tau} \quad \frac{\forall \alpha_1 \dots \alpha_n. \tau \equiv \Gamma(x)}{\Gamma \vdash x : \tau[\tau_1 \dots \tau_n / \alpha_1 \dots \alpha_n]}
\end{array}$$

図 1: Mini-ML の型判定規則 (未完成)

(ただし、 $FV_{\Gamma}(\tau)$ は、 τ 中で自由な型変数のうち、 Γ 内に自由に現れないものの列)