

② $\frac{\rho_1 \vdash d_2 \xrightarrow{d}^* \rho_2}{\vdash \rho_1 \ln d_2 \xrightarrow{d} \rho_1 \ln \rho_2} \equiv \frac{[\underline{x \leftarrow 2}] \vdash d_2 \xrightarrow{d}^* \rho_2 \leftarrow}{\vdash [\underline{x \leftarrow 2}] \ln d_2 \xrightarrow{d} [\underline{x \leftarrow 2}] \ln \rho_2}$ D_8

(a) $\frac{[\underline{x \leftarrow 2}] \vdash d_3 \xrightarrow{d}^* \rho_3}{[\underline{x \leftarrow 2}] \vdash d_3; d_4 \xrightarrow{d} \rho_3; d_4} D_4$

(b) $\frac{[\underline{x \leftarrow 2}][\rho_3] \vdash d_4 \xrightarrow{d}^* \rho_4}{[\underline{x \leftarrow 2}] \vdash \rho_3; d_4 \xrightarrow{d} \rho_3; \rho_4} D_5$

(c) $\frac{[\underline{x \leftarrow 2}] \vdash \rho_3; \rho_4 \xrightarrow{d} \rho_3[\rho_4]}{} D_6$

③ $\vdash \rho_1 \ln \rho_2 \xrightarrow{d} \rho_2 \quad D_9$