

$$\begin{array}{c}
 \textcircled{2} \quad \frac{P_1 \vdash d_2 \xrightarrow{*}_d P_2}{\vdash P_1 \text{ in } d_2 \rightarrow_d P_1 \text{ in } P_2} \equiv \frac{[x \leftarrow 2] \vdash d_2 \xrightarrow{*}_d P_2}{\vdash [x \leftarrow 2] \text{ in } d_2 \rightarrow_d [x \leftarrow 2] \text{ in } P_2} \mathcal{D}_8 \\
 \begin{array}{l}
 \textcircled{a} \quad \frac{[x \leftarrow 2] \vdash d_3 \xrightarrow{*}_d P_3}{[x \leftarrow 2] \vdash d_3; d_4 \rightarrow_d P_3; d_4} \mathcal{D}_4 \\
 \textcircled{b} \quad \frac{[x \leftarrow 2][P_3] \vdash d_4 \xrightarrow{*}_d P_4}{[x \leftarrow 2] \vdash P_3; d_4 \rightarrow_d P_3; P_4} \mathcal{D}_5 \\
 \textcircled{c} \quad [x \leftarrow 2] \vdash P_3; P_4 \rightarrow_d P_3[P_4] \mathcal{D}_6
 \end{array}
 \end{array}$$

$d_2 \equiv d_3; d_4$

$$\textcircled{3} \quad \vdash P_1 \text{ in } P_2 \rightarrow_d P_2 \quad \mathcal{D}_9$$