

$$\begin{array}{c}
 \mathcal{D}_{10} \\
 \mathcal{C}_{11} \vdash \langle \text{var } x:\text{int}=3, \phi \rangle \rightarrow_d \langle \overbrace{[x \leftarrow l_x]}^{\rho}, \overbrace{[l_x \leftarrow 3]}^{\sigma} \rangle \\
 \hline
 \vdash \langle \text{var } x:\text{int}=3; x:=x+1, \phi \rangle \longrightarrow \langle \rho; x:=x+1, \sigma \rangle
 \end{array}$$

$$\begin{array}{c}
 \mathcal{C}_2 \rho \vdash_{\Delta} \langle x, \sigma \rangle \longrightarrow_c \langle 3, \sigma \rangle \quad \rho(x)=l_x \quad \sigma(l_x)=3 \\
 \mathcal{C}_3 \mathcal{C}_1 \vdash_{\Delta} \langle x+1, \sigma \rangle \longrightarrow_c^* \langle 4, \sigma \rangle \\
 \hline
 \mathcal{C}_1 \vdash_{\Delta} \langle x:=x+1, \sigma \rangle \longrightarrow_c \langle x:=4, \sigma \rangle \\
 \mathcal{C}_2 \rho \vdash_{\Delta} \langle x:=4, \sigma \rangle \longrightarrow_c \sigma[l_x \leftarrow 4] \quad \rho(x)=l_x
 \end{array}$$

$$\begin{array}{c}
 \mathcal{C}_{13} \vdash_{\Delta} \langle x:=x+1, \sigma \rangle \longrightarrow_c^* \sigma[l_x \leftarrow 4] \\
 \hline
 \vdash \langle \rho; x:=x+1, \sigma \rangle \longrightarrow_c \sigma[l_x \leftarrow 4]
 \end{array}$$