

$$\mathcal{E}_3 \frac{\mathcal{E}_2 \rho \vdash_{\Delta} \langle x, \sigma_1 \rangle \rightarrow_e \langle 3, \sigma_1 \rangle \quad \rho(x) = \ell_x}{\rho \vdash_{\Delta} \langle x=y, \sigma_1 \rangle \rightarrow_e \langle 3=y, \sigma_1 \rangle} \quad \frac{\rho(x) = \ell_x}{\sigma_1(\ell_x) = 3}$$

$$\mathcal{E}_6 \frac{\mathcal{E}_2 \rho \vdash_{\Delta} \langle y, \sigma_1 \rangle \rightarrow_e \langle 2, \sigma_1 \rangle \quad \rho(y) = 2}{\rho \vdash_{\Delta} \langle 3=y, \sigma_1 \rangle \rightarrow_e \langle 3=2, \sigma_1 \rangle}$$

$$\mathcal{E}_5 \rho \vdash_{\Delta} \langle 3=2, \sigma_1 \rangle \rightarrow_e \langle \text{false}, \sigma_1 \rangle$$

1 $\frac{\mathcal{C}_3 \mathcal{C}_5}{\rho \vdash_{\Delta} \langle \text{if } x=y \text{ then } x:=5 \text{ else } x:=6, \sigma_1 \rangle \rightarrow_c^* \langle x:=6, \sigma_1 \rangle}$

2 $\mathcal{C}_2 \rho \vdash_{\Delta} \langle x:=6, \sigma_1 \rangle \rightarrow_c \sigma_1[\ell_x \leftarrow 6] \quad \rho(x) = \ell_x$