

$$(B \rho) \longrightarrow B \quad [\rho\text{-bool}]$$

$$(N \rho) \longrightarrow N \quad [\rho\text{-num}]$$

$$(CH \rho) \longrightarrow CH \quad [\rho\text{-str}]$$

$$(O \rho) \longrightarrow O \quad [\rho\text{-op}]$$

$$((M_1 M_2) \rho) \longrightarrow ((M_1 \rho) (M_2 \rho)) \quad [\rho\text{-app}]$$

$$((\text{mlet } (X) = M_1 \text{ in } M_2) \rho) \longrightarrow (\text{mlet } (X) = (M_1 \rho) \text{ in } (M_2 \rho)) \quad [\rho\text{-let}]$$

$$(X \rho) \longrightarrow W \quad [\rho\text{-x}]$$

where  $\text{lookup7} \llbracket \rho, X, W \rrbracket$

$$(X \rho) \longrightarrow \text{nameerror} \quad [\rho\text{-xErr}]$$

where  $\text{predicado1} \llbracket \rho, X \rrbracket$

$$(((\lambda (X) M) \rho) W) \longrightarrow (M \text{ext} \llbracket \rho, (X W) \rrbracket) \quad [\text{app}]$$

$$((X_1 \rho_1) W_2) \longrightarrow (W_1 W_2) \quad [\text{app13}]$$

where  $\text{lookup6} \llbracket \rho_1, X_1, \text{fun}, W_1 \rrbracket$

$$(OB (X_2 \rho_2)) \longrightarrow W_2 \quad [\delta B1]$$

where  $\text{lookup6} \llbracket \rho_2, X_2, \text{bool}, W_1 \rrbracket, \delta B \llbracket (OB W_1), W_2 \rrbracket$

$$(ON (X_2 \rho_2)) \longrightarrow W_2 \quad [\delta N1]$$

where  $\text{lookup6} \llbracket \rho_2, X_2, \text{num}, W_1 \rrbracket, \delta N \llbracket (ON W_1), W_2 \rrbracket$

$$(OB B) \longrightarrow W_1 \quad [\delta B]$$

where  $\delta B \llbracket (OB B), W_1 \rrbracket$

$$(ON N) \longrightarrow W_1 \quad [\delta N]$$