CMPT 383 H6, 301570853 mahdi Beigahmadi

①

$$\frac{E \vdash e_1 : c_1 \quad E \vdash e_2 : c_2 \quad c_1 \leq c_2}{E \vdash e_1 \leq e_2 : true} \qquad \frac{E \vdash e_1 : c_1 \quad E \vdash e_2 : c_2 \quad c_1 > c_2}{E \vdash e_1 \leq e_2 : false}$$

②

$$\frac{\dfrac{E[x \triangleleft 2] \vdash 1 : 1 \qquad \dfrac{\text{Ident } x \quad E[x \triangleleft 2](x) = 2}{E[x \triangleleft 2] \vdash x : 2}}{E \vdash 2 : 2 \qquad E[x \triangleleft 2] \vdash x+1 : 3}}{E \vdash \text{let } x = 2 \text{ in } x+1 : 3}$$

③

negative Number

$$\frac{E \vdash e_1 : c \quad c < 0 \qquad E \vdash e_2 : \surd}{E \vdash \text{testSign } e_1\ e_2\ e_3\ e_4 : \surd}$$

zero

$$\frac{E \vdash e_1 : 0 \qquad E \vdash e_3 : \surd}{E \vdash \text{testSign } e_1\ e_2\ e_3\ e_4 : \surd}$$

positive num

$$\frac{E \vdash e_1 : c \quad c > 0 \qquad E \vdash e_4 : \surd}{E \vdash \text{testSign } e_1\ e_2\ e_3\ e_4 : \surd}$$

④

$$\frac{\langle e_1, E \rangle \longrightarrow \langle e_1', E' \rangle}{\langle \text{testSign } e_1\ e_2\ e_3\ e_4, E \rangle \longrightarrow \langle \text{testSign } e_1'\ e_2\ e_3\ e_4, E' \rangle}$$

$$\frac{c < 0}{\langle \text{testSign } c\ e_2\ e_3\ e_4, E \rangle \longrightarrow \langle e_2, E \rangle}$$

$$\frac{}{\langle \text{testSign } 0\ e_2\ e_3\ e_4, E \rangle \longrightarrow \langle e_3, E \rangle}$$

$$\frac{c > 0}{\langle \text{testSign } c\ e_2\ e_3\ e_4, E \rangle \longrightarrow \langle e_4, E \rangle}$$