Sequent calculus **LJ**

$$\frac{\Gamma, \varphi, \psi, \Gamma' \vdash \delta}{\Gamma, \psi, \varphi, \Gamma' \vdash \delta}\,\mathcal{L}\mathsf{X} \qquad \frac{\Gamma \vdash \delta}{\Gamma, \varphi \vdash \delta}\,\mathcal{L}\mathsf{W} \qquad \frac{\Gamma \vdash \bot}{\Gamma \vdash \varphi}\,\mathcal{R}\mathsf{W} \qquad \frac{\Gamma, \varphi, \varphi \vdash \delta}{\Gamma, \varphi \vdash \delta}\,\mathcal{L}\mathsf{C}$$

$$\frac{}{\varphi \vdash \varphi}\,\mathsf{Ax} \qquad \frac{\Gamma \vdash \varphi \qquad \Gamma', \varphi \vdash \delta}{\Gamma, \Gamma' \vdash \delta}\,\mathsf{Cut}$$

$$\frac{\Gamma, \varphi \vdash \delta}{\Gamma, \varphi \wedge \psi \vdash \delta}\,\mathcal{L}1\wedge \qquad \frac{\Gamma, \psi \vdash \delta}{\Gamma, \varphi \wedge \psi \vdash \delta}\,\mathcal{L}2\wedge \qquad \frac{\Gamma \vdash \varphi \qquad \Gamma' \vdash \psi}{\Gamma, \Gamma' \vdash \varphi \wedge \psi}\,\mathcal{R}\wedge$$

$$\frac{\Gamma \vdash \varphi}{\Gamma \vdash \varphi \vee \psi}\,\mathcal{R}1\vee \qquad \frac{\Gamma \vdash \psi}{\Gamma \vdash \varphi \vee \psi}\,\mathcal{R}2\vee \qquad \frac{\Gamma, \varphi \vdash \delta \qquad \Gamma', \psi \vdash \delta}{\Gamma, \Gamma', \varphi \vee \psi \vdash \delta}\,\mathcal{L}\vee$$

$$\frac{\Gamma \vdash \varphi \qquad \Gamma', \psi \vdash \delta}{\Gamma, \Gamma', \varphi \to \psi \vdash \delta}\,\mathcal{L}\to \qquad \frac{\Gamma, \varphi \vdash \psi}{\Gamma \vdash \varphi \to \psi}\,\mathcal{R}\to$$

$$\frac{\Gamma, \varphi[\frac{t}{x}] \vdash \delta}{\Gamma, \forall x.\varphi \vdash \delta}\,\mathcal{L}\forall \qquad \frac{\Gamma \vdash \varphi}{\Gamma \vdash \forall x.\varphi}\,\mathcal{R}\forall \qquad \frac{\Gamma, \varphi \vdash \delta}{\Gamma, \exists x.\varphi \vdash \delta}\,\mathcal{L}\exists \qquad \frac{\Gamma \vdash \varphi[\frac{t}{x}]}{\Gamma \vdash \exists x.\varphi}\,\mathcal{R}\exists$$

in $\mathcal{R}\forall$ and $\mathcal{L}\exists$, the variable x must not be free in $\Gamma \cup \{\delta\}$.