

# Inference rules for propositional logic

$$\frac{\alpha, \neg\alpha}{\perp} (\perp\text{I})$$

$$\frac{\begin{array}{|l} \alpha \\ \perp \end{array}}{\neg\alpha} (\neg\text{I})$$

$$\frac{\begin{array}{|l} \neg\alpha \\ \perp \end{array}}{\alpha} (\neg\text{E})$$

$$\frac{\alpha \rightarrow \beta, \beta \rightarrow \alpha}{\alpha \leftrightarrow \beta} (\leftrightarrow\text{I})$$

$$\frac{\alpha_1, \alpha_2, \dots, \alpha_n}{\alpha_1 \wedge \alpha_2 \wedge \dots \wedge \alpha_n} (\wedge\text{I})$$

$$\frac{\alpha_1 \wedge \alpha_2 \wedge \dots \wedge \alpha_n}{\alpha_i} (\wedge\text{E})$$

$$\frac{\alpha \leftrightarrow \beta}{\alpha \rightarrow \beta} (\leftrightarrow\text{E})$$

$$\frac{\alpha_i}{\alpha_1 \vee \alpha_2 \vee \dots \vee \alpha_n} (\vee\text{I})$$

$$\frac{\alpha \vee \beta, \alpha \rightarrow \chi, \beta \rightarrow \chi}{\chi} (\vee\text{E})$$

$$\frac{\begin{array}{|l} \alpha \\ \beta \end{array}}{\alpha \rightarrow \beta} (\rightarrow\text{I})$$

$$\frac{\alpha \rightarrow \beta, \alpha}{\beta} (\rightarrow\text{E})$$

