

## ntd.1 Propositional Rules

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sec

### Rules for $\wedge$

$$\frac{\varphi \quad \psi}{\varphi \wedge \psi} \wedge\text{Intro} \qquad \frac{\varphi \wedge \psi}{\varphi} \wedge\text{Elim} \qquad \frac{\varphi \wedge \psi}{\psi} \wedge\text{Elim}$$

### Rules for $\vee$

$$\frac{\varphi}{\varphi \vee \psi} \vee\text{Intro} \qquad \frac{\psi}{\varphi \vee \psi} \vee\text{Intro} \qquad \begin{array}{c} [\varphi]^n \quad [\psi]^n \\ \vdots \quad \vdots \\ \chi \quad \chi \\ \hline n \frac{\varphi \vee \psi}{\chi} \vee\text{Elim} \end{array}$$

### Rules for $\rightarrow$

$$\begin{array}{c} [\varphi]^n \\ \vdots \\ \psi \\ \hline n \frac{\varphi \rightarrow \psi}{\varphi \rightarrow \psi} \rightarrow\text{Intro} \end{array} \qquad \frac{\varphi \rightarrow \psi \quad \varphi}{\psi} \rightarrow\text{Elim}$$

### Rules for $\neg$

$$\begin{array}{c} [\varphi]^n \\ \vdots \\ \perp \\ \hline n \frac{\perp}{\neg\varphi} \neg\text{Intro} \end{array} \qquad \frac{\neg\varphi \quad \varphi}{\perp} \neg\text{Elim}$$

## Rules for $\perp$

$$\frac{\perp}{\varphi} \perp_I \qquad \begin{array}{c} [\neg\varphi]^n \\ \vdots \\ n \frac{\perp}{\varphi} \perp_C \end{array}$$

Note that  $\neg$ -Intro and  $\perp_C$  are very similar: The difference is that  $\neg$ -Intro derives a negated **sentence**  $\neg\varphi$  but  $\perp_C$  a positive **sentence**  $\varphi$ .

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## Bibliography