

$$\frac{\begin{array}{c} \vdots \\ \varphi \end{array} \quad \begin{array}{c} \vdots \\ \psi \end{array}}{\varphi \wedge \psi} \wedge I$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \wedge \psi \end{array}}{\varphi} \wedge_1 E$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \wedge \psi \end{array}}{\psi} \wedge_2 E$$

~~ϕ~~

$$\frac{\begin{array}{c} \vdots \\ \perp \end{array}}{\neg \varphi} \neg I$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \end{array} \quad \begin{array}{c} \vdots \\ \neg \varphi \end{array}}{\perp} \neg E$$

~~ϕ~~

$$\frac{\begin{array}{c} \vdots \\ \psi \end{array}}{\varphi \rightarrow \psi} \rightarrow I$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \end{array} \quad \begin{array}{c} \vdots \\ \varphi \rightarrow \psi \end{array}}{\psi} \rightarrow E$$

~~ϕ~~

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$$\frac{\begin{array}{c} \vdots \\ \psi \end{array} \quad \begin{array}{c} \vdots \\ \varphi \end{array}}{\varphi \leftrightarrow \psi} \leftrightarrow I$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \end{array} \quad \begin{array}{c} \vdots \\ \varphi \leftrightarrow \psi \end{array}}{\psi} \leftrightarrow_1 E$$

$$\frac{\begin{array}{c} \vdots \\ \psi \end{array} \quad \begin{array}{c} \vdots \\ \varphi \leftrightarrow \psi \end{array}}{\varphi} \leftrightarrow_2 E$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \end{array}}{\varphi \vee \psi} \vee_1 I$$

$$\frac{\begin{array}{c} \vdots \\ \psi \end{array}}{\varphi \vee \psi} \vee_2 I$$

$$\frac{\begin{array}{c} \vdots \\ \varphi \vee \psi \end{array} \quad \begin{array}{c} \vdots \\ \sigma \end{array} \quad \begin{array}{c} \vdots \\ \sigma \end{array}}{\sigma} \vee E$$

~~$\neg \phi$~~

$$\frac{\begin{array}{c} \vdots \\ \perp \end{array}}{\varphi} \perp E$$

$$\frac{\begin{array}{c} \vdots \\ \perp \end{array}}{\varphi} RAA$$