

Exercício 12:

$$\boxed{\varphi, \neg\varphi \vdash \neg\gamma}$$

regra 8 \Rightarrow

$$\frac{\frac{\frac{\varphi, \neg\varphi, \gamma \vdash \neg\varphi}{\varphi, \neg\varphi, \gamma \vdash \varphi} (\neg e)}{\varphi, \neg\varphi, \gamma \vdash \perp} (\neg i)}{\varphi, \neg\varphi \vdash \neg\gamma} (\neg i)$$

$\underbrace{\varphi, \neg\varphi}_{\perp} \vdash \underbrace{\neg\gamma}_{\varphi} \leftarrow \text{regra 7}$