

$$\frac{\varphi \rightarrow \psi}{(\neg\varphi) \vee \psi} (R)$$

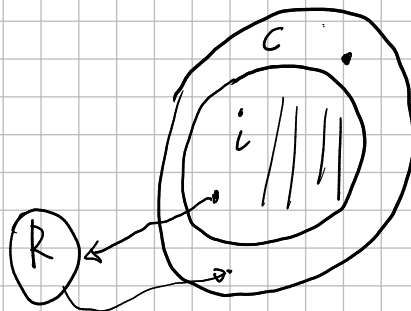
$\neg\neg ? \vdash ?$

Para (R) ser clássica, etc deve ser tão expressiva quanto qualquer lógica clássica.

$$R + i$$

$$\downarrow$$

$$C$$



$$(\neg\neg A) \rightarrow (\neg\neg B) \vdash \neg\neg(A \rightarrow B)$$

$$\frac{(\neg\neg A) \rightarrow (\neg\neg B) \quad \frac{[A]^u}{\neg\neg A} (\neg\neg i)}{\neg\neg B} (\neg\neg e) \quad \times$$

$$\frac{\neg\neg B}{B} (\neg\neg i) \cup$$

$$\frac{A \rightarrow B}{\neg\neg(A \rightarrow B)} (\neg\neg i)$$

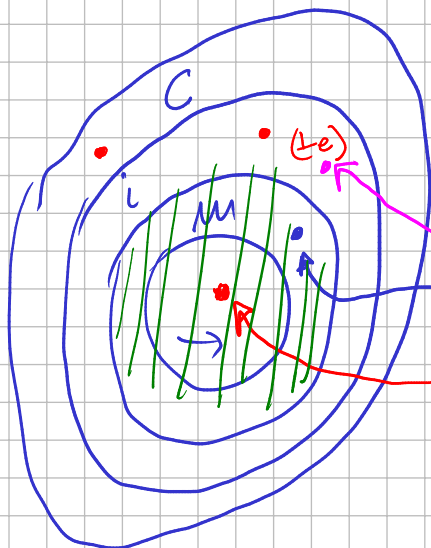
$$A \vdash_m \neg\neg A$$

minimal

$$\frac{A}{\neg\neg A} (\neg\neg i)$$

$$\frac{A \quad [A]^u}{\perp} (\neg\neg e)$$

$$\frac{\perp}{\neg\neg A} (\neg\neg i) \cup$$



$\rightarrow_i$	$\rightarrow_e$
$\wedge_i$	$\wedge_e$
$\vee_i$	$\vee_e$

$$\neg A = A \rightarrow \perp$$

$$(\exists x \phi) \wedge \psi \vdash \exists x (\phi \wedge \psi)$$

$$\frac{(\exists x \phi) \wedge \psi}{\exists x \phi} \quad (\wedge e)$$

$$\frac{\frac{[\phi[x/x_0]]^u}{\exists x (\phi \wedge \psi)} \quad \frac{(\exists x \phi) \wedge \psi}{\psi} (\wedge e)}{\exists x (\phi \wedge \psi)} (\exists i) \quad \frac{\exists x (\phi \wedge \psi)}{\exists x \phi} (\exists e) u$$

$$\phi \equiv p(x)$$

$$\exists x \phi \equiv \exists x p(x) \rightarrow p(x_0)$$

$$\psi \equiv p(y)$$

$$\forall \omega \exists z (p(f(z), \omega))$$

$\forall \exists$