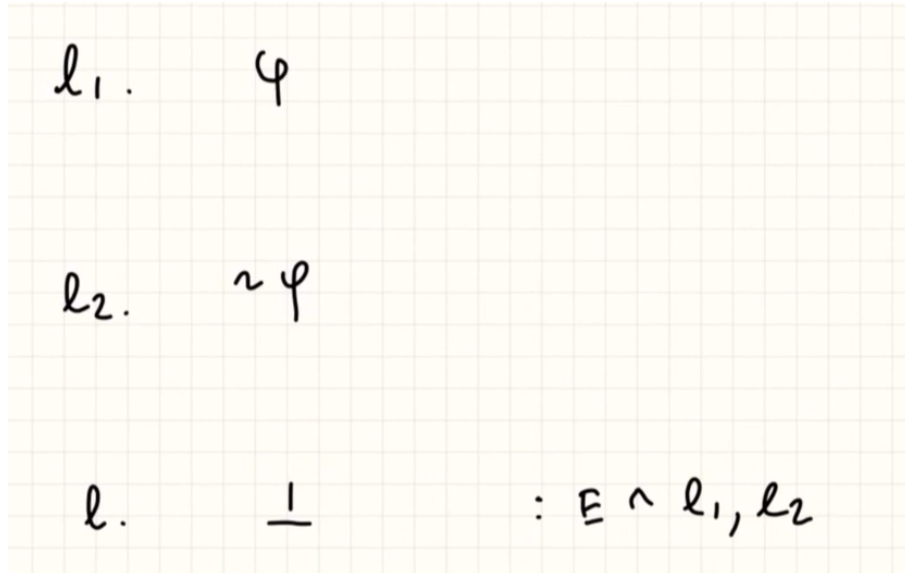


Logic, First Course, Winter 2020. Week 7, Lecture 1, Handout.

Elimination rule for negation



Example 1. $p \rightarrow \neg q, q, p \vdash \perp$.

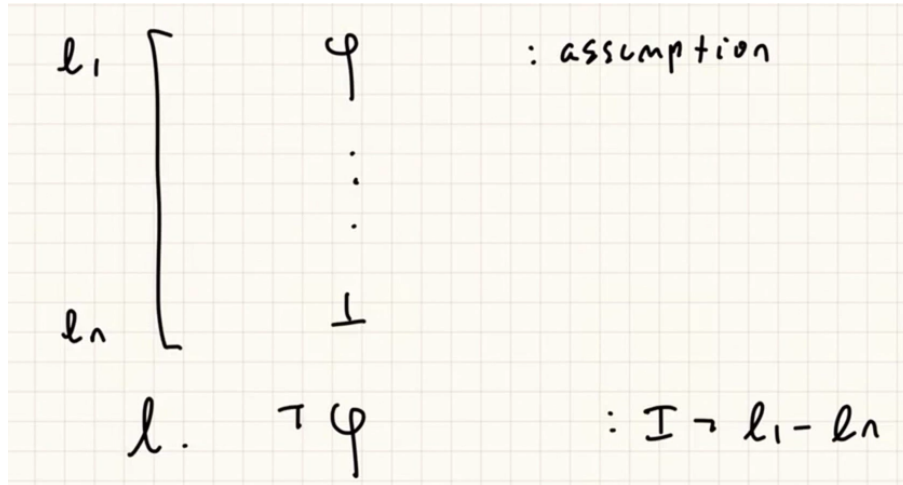
exercise

$(p \rightarrow \neg q), q, p \vdash \perp$

1. $p \rightarrow \neg q$:assumption
2. q :assumption
3. p :assumption

Introduction rule for negation

Here is a picture of the rule:



Example 2. $p \vdash \neg\neg p$.

exercise

$p \vdash \neg\neg p$

1. p :assumption

A very common pattern

A very common pattern to get used to and to anticipate in these proofs is this one:

1.	ψ	: assumption
2.	ψ	: assumption
	.	
	.	
	.	
50.	$\neg \psi$	
51.	\perp	: E \neg 1, 50
52.	$\neg \psi$: I \neg 2 - 51

Illustrating the common pattern

Example 3. $q \vdash \neg(p \wedge \neg q)$.

exercise

$q \vdash \neg(p \wedge \neg q)$

1. q : assumption

Illustrating the common pattern again

Example 4. $q, p \rightarrow \neg q \vdash \neg p$.

Second, you can try to input it into the proof-checker yourself, or come back later and practice:

exercise

$q, (p \rightarrow \neg q) \vdash \neg p$

1. q :assumption
2. $p \rightarrow \neg q$:assumption

A more challenging example

Example 5. $\neg \neg p \vdash \neg p$.

exercise

$\neg \neg p \vdash \neg p$

1. $\neg \neg p$:assumption

These is a handout for [this course](#).¹

1. It is run on the Carnap software, which is ↩

An **Open Tower** project. Copyright 2015-2019 G. Leach-Krouse <gleachkr@ksu.edu> and J. Ehrlich