

Logic, First Course, Winter 2020. Week 6, Section Meeting. [Back to course website](#)

Simple examples of proofs

In this section meeting, we just focus on doing some simple examples of proofs, and practice inputting them into the proof-checker.

Example 1.

exercise

$(a \wedge (b \wedge c)), (d \wedge e) \vdash (b \wedge e)$

1. $a \wedge (b \wedge c)$:assumption
2. $d \wedge e$:assumption

Example 2.

exercise

$(a \wedge (b \wedge c)), (f \rightarrow (d \wedge e)) \vdash (f \rightarrow (b \wedge e))$

1. $a \wedge (b \wedge c)$:assumption
2. $f \rightarrow (d \wedge e)$:assumption

Example 3.

exercise

$(a \rightarrow (b \rightarrow c)), a, b \vdash c$

1. $a \rightarrow (b \rightarrow c)$:assumption
2. a :assumption
3. b :assumption

Example 4.

exercise

$(a \rightarrow b), (b \rightarrow c), (c \rightarrow d) \vdash (a \rightarrow d)$

1. $a \rightarrow b$:assumption
2. $b \rightarrow c$:assumption
3. $c \rightarrow d$:assumption

Example 5.

exercise

$(a \rightarrow (b \wedge d)), (b \rightarrow c) \vdash (a \rightarrow (c \wedge d))$

1. $a \rightarrow (b \wedge d)$:assumption
2. $b \rightarrow c$:assumption

Example 6.

exercise

$(p \wedge r), (q \wedge r) \vdash (p \wedge q)$

1. $p \wedge r$:assumption
2. $q \wedge r$:assumption

Example 7.

exercise

$(p \rightarrow (q \rightarrow r)) \vdash ((p \rightarrow q) \rightarrow (p \rightarrow r))$

1. $p \rightarrow (q \rightarrow r)$:assumption

Example 8.

exercise

$((p \wedge q) \rightarrow (r \rightarrow t)) \vdash ((p \wedge r) \rightarrow (q \rightarrow t))$

1. $(p \wedge q) \rightarrow (r \rightarrow t)$:assumption

Example 10.

exercise

$(q \rightarrow t), (r \rightarrow s) \vdash ((q \wedge r) \rightarrow (s \wedge t))$

1. $q \rightarrow t$:assumption
2. $r \rightarrow s$:assumption

Example 9.

exercise

$p, (p \rightarrow (q \wedge r)), (r \rightarrow s) \vdash (q \wedge s)$

1. p :assumption
2. $p \rightarrow (q \wedge r)$:assumption
3. $r \rightarrow s$:assumption

This is a practice problem set for [this course](#). It is run on the Carnap software, which is an:

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