CL Tutorial 5

# Exercise 1

* Reduce the sequent and use the result to derive the rule .

Right-hand rule:

# Exercise 2

* Reduce the sequents and ¬ and use the results to write rules and , respectively.

1.

Right-hand rule:

2.

Left-hand rule:

# Exercise 3

* Reduce the sequents and and use the results to write rules and , respectively.

1.

Right-hand rule:

2.

Left-hand rule:

# Exercise 4

1.

is universally valid as both sides reduce to .

2.

is not universally valid.

3.

is not universally valid.

is not universally valid.

# Exercise 5

1.

Shifting everything to the right:

CNF:

2.

Shifting everything to the right:

CNF: (

3.

Shifting everything to the right:

CNF:

4.

Shifting everything to the right:

CNF: