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Week 6, Practice Problems

The practice problems fall into two groups:

- Memorizing rules
- Simple proofs

Memorizing rules

The first set of ten problems is just practice in memorizing the rules, with substitution instances. In each case below, the proof is exactly one line long, except for the last two proofs involving arrow introduction, which are three lines long.

Example 1.

Example 2.



Example 3.



Example 4.

exercise $k \vdash ((i \land j) \lor k)$ 1. k :assumption

Example 6.

```
exercise

\frac{d, (d \to (e \land f)) \vdash (d \lor e)}{1. d : assumption}

2. d \to (e \land f) : assumption
```

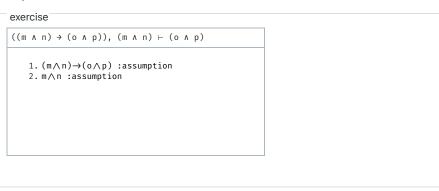
Example 5.

```
exercise

d, (d \rightarrow (e \land f)) \vdash (e \land f)

1. d :assumption
2. d \rightarrow (e \land f) :assumption
```

Example 7.



Example 8.

```
exercise  \begin{array}{l} (h \ v \ i), \ (h \rightarrow (k \ \Lambda \ p)), \ (i \rightarrow (k \ \Lambda \ p)) \vdash (k \ \Lambda \ p) \\ \\ 1. \ h \lor i : assumption \\ 2. \ h \rightarrow (k \land p) : assumption \\ 3. \ i \rightarrow (k \land p) : assumption \\ \end{array}
```

Example 10.



Example 9.



Simple proofs

These next set of ten problems are just simple proofs, like the ones done in lecture and section.

Example 11.

Example 12.

```
exercise p \vdash (q \rightarrow (p \land q))
1. p :assumption
```

Example 13.

Example 14.

```
exercise  (p \rightarrow q), (r \rightarrow s) \vdash (p \rightarrow (r \rightarrow (q \land s))) 
 1. p \rightarrow q : assumption 
 2. r \rightarrow s : assumption
```

Example 15.

Example 16.

```
exercise
(a \ v \ b) \vdash (b \ v \ a)
1. \ a \lor b \ : assumption
```

Example 17.

Example 18.

```
exercise  \begin{array}{c} (p \rightarrow (q \ v \ v)), \ (r \rightarrow (q \ v \ v)), \ (p \ v \ r) \vdash (q \ v \ v) \\ \\ 1. \ p \rightarrow (q \lor v) : assumption \\ 2. \ r \rightarrow (q \lor v) : assumption \\ 3. \ p \lor r : assumption \\ \end{array}
```

Example 19.

Example 20.

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

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