

- 1) V - (modus ponens)
- 2) V - Simplification
- 3) I
- 4) V - (modus ponens)
- 5) I
- 6) V - Simplification

If you cannot directly use a rule of inference, always prove by drawing up an assertion/justification table, label the hypotheses and prove how it works.

Show that the following argument is valid:

h1: $x \Rightarrow y$
h2: $w \Rightarrow z$
h3: $\sim z \wedge \sim y$
- - - - $\sim x \wedge \sim w$

Assertion	Justification
1. $\sim z \wedge \sim y$	h3
2. $\sim z$	1, simplification
3. $w \Rightarrow z$	h2
4. $\sim w$	2, 3, modus tollens
5. $\sim y$	1, simplification
6. $x \Rightarrow y$	h1
7. $\sim x$	5, 6, modus tollens
8. $\sim x \wedge \sim y$	5, 7, conjunction

R: I read a lot
W: I am well-educated
B: I am boring
F: I have friends
U: I am rude

h1: $R \Rightarrow W \vee B$ h2: $B \vee U \Rightarrow \sim F$ h3: $R \wedge F$ - - - - W

| Assertion | Justification | | — | — | | 1. $R \wedge F$ | h3 | | 2. R | 1, simplification | |
3. $R \Rightarrow W \vee B$ | h1 | | 4. $W \vee B$ | 2, 3, modus ponens | | 5. F | 1, simplification

| | 6. $B \vee U \Rightarrow \sim F$ | h2 | | 7. $\sim(B \vee U)$ | 5, 6, modus tollens | FINISH