

Homework 1

This homework requires only material from lecture and precepts; there is no need to refer to any material in the Lemmon book. Due: 4pm on Friday, Feb 17. Turn in to your preceptor's inbox in the hallway between 1879 and Marx Halls.

1. Translate each of the following sentences into symbolic form. First identify the elementary component sentences, and abbreviate each with a (distinct) capital letter. Then translate the original sentence using the symbols $\vee, \wedge, \neg, \rightarrow$ for the logical words “or”, “and”, “not”, “if...then...”. (Recall that an “elementary” component sentence is one that does not itself contain logical words. We have suggested letters for the elementary sentences at the end of each sentence.)
 - (a) It's not true that if Jane Austen wrote a book then it has a happy ending. (W, H)
 - (b) Hegel was neither a great philosopher nor a great historian (P, H)
 - (c) Sieglinde will survive, and either her son will gain the Ring and Wotan's plan will be fulfilled or else Valhalla will be destroyed. (S, G, F, D)
 - (d) Wotan and Alberic will not both be satisfied. (W, A)
2. Prove that the following argument forms are valid. The premises are numbered, and the conclusion is to the right of the “//”. Each line of your proof must be justified by one of our rules of inference: MPP, MTT, DN, \wedge I, \wedge E, or \vee I.
 - (a)
 1. $P \rightarrow (Q \rightarrow R)$
 2. $P \rightarrow Q$
 3. P // conclusion R
 - (b)
 1. $\neg\neg Q \rightarrow P$
 2. $\neg P$ // conclusion $\neg Q$
 - (c)
 1. $(A \vee B) \rightarrow T$
 2. $Z \rightarrow A$
 3. $T \rightarrow W$
 4. Z // conclusion W
 - (d)
 1. $(A \rightarrow B) \wedge (C \rightarrow A)$
 2. $(C \wedge (W \rightarrow Z)) \wedge W$ // conclusion $(B \vee D) \wedge (Z \vee E)$
3. Demonstrate that the following argument form is invalid by providing a counterexample, i.e. give English sentences for P and Q so that the premises are true and the conclusion false.
 1. $P \rightarrow \neg Q$
 2. $\neg P$ // conclusion Q