

A Appendix: Answers to Selected Exercises

A.1 Chapter 1 Answers

Exercise 1.1 Validity and soundness

i False ii False iii True iv False v False
vi True vii True viii False ix True x False

Exercise 1.2 Expressions

i Not an expression ii Expression iii Expression
iv Expression v Not an expression vi Expression
vii Not an expression viii Expression ix Not an expression
x Expression xi Not an expression xii Not an expression
xiii Expression xiv Expression xv Not an expression

Exercise 1.3.1 Wffs

i Atomic Sentence
ii Not wff
iii Not wff
iv Conditional: Antecedent A; Consequent B
v Not wff
vi Conditional: Antecedent A; Consequent ($B \rightarrow C$)
vii Conditional: Antecedent ($P \& Q$); Consequent R
viii Disjunction: Left disjunct ($A \& B$); Right disjunct ($C \rightarrow (D \leftrightarrow G)$)
ix Negation
x Not wff; requires outer parentheses to be a disjunction
xi Not wff
xii Not wff
xiii Conjunction: Left conjunct $\sim(P \& P)$; Right conjunct ($P \leftrightarrow (Q \vee \sim Q)$)
xiv Biconditional: Left side $\sim((B \vee P) \& C)$; Right side $((D \vee \sim G) \rightarrow H)$
xv Not wff

Exercise 1.3.2 Parenthesis conventions

iv $A \rightarrow B$ vi $A \rightarrow (B \rightarrow C)$
vii $P \& Q \rightarrow R$ viii $(A \& B) \vee (C \rightarrow (D \leftrightarrow G))$
xiii $\sim(P \& P) \& (P \leftrightarrow Q \vee \sim Q)$ xiv $\sim((B \vee P) \& C) \leftrightarrow D \vee \sim G \rightarrow H$

None of the other items in this exercise are wffs.