

A.3 Chapter 3 Answers

Exercise 3.1: Truth tables

	i	ii	iii	iv
P Q	$P \vee (\sim P \vee Q)$	$\sim (P \& Q) \vee P$	$\sim (P \rightarrow Q) \rightarrow P$	$(P \vee Q) \vee (\sim P \& Q)$
T T	T F T	F T T	F T T	T T F F
T F	T F F	T F T	T F T	T T F F
F T	T T T	T F T	F T T	T T T T
F F	T T T	T F T	F T T	F F T F

P Q R	v	vi
P Q R	$P \vee Q \rightarrow R \vee \sim P$	$R \leftrightarrow \sim P \vee (R \& Q)$
T T T	T T T F	T F T T
T T F	T F F F	T F F F
T F T	T T T F	F F F F
T F F	T F F F	T F F F
F T T	T T T T	T T T T
F T F	T T T T	F T T F
F F T	F T T T	T T T F
F F F	F T T T	F T T F

P Q	vii	viii
P Q	$(P \& Q \leftrightarrow Q) \rightarrow (Q \rightarrow P)$	$(P \leftrightarrow \sim Q) \leftrightarrow (\sim P \leftrightarrow \sim Q)$
T T	T T T T	F F F F T F
T F	F T T T	T T F F F T
F T	F F T F	T F F T F F
F F	F T T T	F T F T T T

P Q R	ix
P Q R	$(P \leftrightarrow Q) \leftrightarrow (P \vee R \rightarrow (\sim Q \rightarrow R))$
T T T	T T T T F T
T T F	T T T T F T
T F T	F F T T T T
T F F	F T T F T F
F T T	F F T T F T
F T F	F F F T F T
F F T	T T T T T T
F F F	T T F T T F