

p.85 B1

A	$A \rightarrow A$	$\neg A \rightarrow \neg A$	$A \wedge A$	$A \vee A$
T	T	F	T	T
F	T	T	F	F

← since this valuation has T in all cols, jointly possible

p.85 B3

A	B	C	$B \wedge (C \vee A)$	$A \rightarrow B$	$\neg(B \vee C)$
T	T	T	T	T	F
T	T	F	T	T	F
T	F	F	F	F	F
T	F	T	F	F	T
T	F	F	F	F	T
F	T	T	T	T	F
F	T	F	F	T	F
F	F	T	F	T	F
F	F	F	F	T	T

No valuation makes the three sentences true at the same time \rightarrow jointly unsatisfiable

p.85 C1

conclu	prem
A	$A \rightarrow A$
T	T
F	T

\Rightarrow shows the argument is invalid because $A \rightarrow A$ does NOT entail A

p.85 C4

A	B	C	premises			conclu
			$A \vee B$	$B \vee C$	$\neg A$	$B \wedge C$
T	T	T	T	T	F	T
T	T	F	T	T	F	F
T	F	T	T	T	F	F
T	F	F	T	F	F	F
F	T	T	T	T	T	T
F	T	F	T	T	T	F
F	F	T	F	T	T	F
F	F	F	F	F	T	F

\Rightarrow shows argument is invalid b/c premises true + conclusion false in this valuation (i.e. $A \vee B, B \vee C, \text{ and } \neg A$ do NOT entail $B \wedge C$)

p.85 D4

A	B	$\neg[A \rightarrow (B \rightarrow A)]$
T	T	F
T	F	T
F	T	T
F	F	T

~~\Rightarrow Contingent sentence~~
 \Rightarrow tautology

p. 85 D5

3

A	B	$A \leftrightarrow [A \rightarrow (B \wedge \neg B)]$
T	T	F
T	F	F
F	T	F
F	F	F

\Rightarrow contradiction

p. 85-86 E5

A	B	$[A \wedge (A \vee B)] \rightarrow B$	$A \rightarrow B$
T	T	T	T
T	F	F	F
F	T	T	T
F	F	F	T

columns match \Rightarrow equivalent

p. 86 G4

A	B	$A \rightarrow B$	$A \wedge \neg B$
T	T	T	F
T	F	F	T
F	T	T	F
F	F	T	F

\rightarrow no valuation exists that makes both sentences true, therefore they are jointly unsatisfiable

p. 87 J1 | $A \vee [A \rightarrow (A \leftrightarrow A)] \therefore A$

A	$A \vee [A \rightarrow (A \leftrightarrow A)]$
T	T
F	T

conclu. premise

→ not valid because $A \vee [A \rightarrow (A \leftrightarrow A)]$ does not entail A — this is because the second row is a valuation for which the premise is true and the conclusion is false

p. 87 J3

A	B	premises		conclu
		$A \rightarrow B$	$\neg A$	$\neg B$
T	T	T	F	F
T	F	F	F	T
F	T	T	T	F
F	F	T	T	T

→ not valid b/c $A \rightarrow B$ and $\neg A$ do not entail $\neg B$

p. 87 J4

A	B	$\neg(A \rightarrow \neg B)$
T	T	F
T	F	T
F	T	T
F	F	T

premises conclusion

→ valid b/c there is no valuation making premises true & conclusion false