Dominic Fardino

Math Logic Assignment 3 2/8/2019

5.3) #5:

$(A \vee B) \wedge (C \vee D) \wedge (E \vee F)$ in DNF.

$(A \wedge C \wedge E) \vee (A \wedge C \wedge F) \vee (A \wedge D \wedge E) \vee (A \wedge D \wedge F) \vee$
$(B \wedge C \wedge E) \vee (B \wedge C \wedge F) \vee (B \wedge D \wedge E) \vee (B \wedge D \wedge F)$

Trivial going from CNF => DNF.

6.4 Section Exercises

1.)

A	B	A→B	¬A∨B	¬(A∧¬B)
T	T	T	T	T
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T

Equal Values

2.)

A	B	C	A→B	B∧C	B∧C→A	(A→B)∧(B∧C→A)
T	T	T	T	T	T	T
T	T	F	T	F	T	T
T	F	T	F	F	T	F
T	F	F	F	F	T	F
F	T	T	T	T	F	F
F	T	F	T	F	T	T
F	F	T	T	F	T	T
F	F	F	T	F	T	T

3.) $A \to B$ and $\neg B \to \neg A$

A	B	$A \to B$	$\neg B \to \neg A$
T	T	T	T
T	F	F	F
F	T	T	T
F	F	T	T

Equal Values ✓

4.) $A \to B \vee C, \neg B \to \neg C \models A \to B$

$\{A \to B \vee C, \neg B \to \neg C\} \models A \to B$

A	B	C	$B \vee C$	$A \to B \vee C$	$\neg B \to \neg C$	$A \to B$	
T	T	T	T	T	T	T	✓
T	T	F	T	T	T	T	✓
T	F	T	T	T	F	F	
T	F	F	F	F	T	F	
F	T	T	T	T	T	T	✓
F	T	F	T	T	T	T	✓
F	F	T	T	T	F	T	
F	F	F	F	T	T	T	✓

$C \to B$