

Homework 2

1.3 (1-5, 14, 17, 41, 42, 73)

1.4 (5, 6, 11, 12, 30, 31, 34, 35, 39, 41)

Section 1.3

2)

p	q	$\sim q$	$p \wedge (\sim q)$
T	T	F	F
T	F	T	T
F	T	F	F
F	F	T	F

4)

p	$\sim p$	$p \wedge (\sim p)$
T	F	F
F	T	F

14)

p	q	r	$q \vee r$	$\sim(q \vee r)$	$p \vee (\sim(q \vee r))$
T	T	T	T	F	T
T	T	F	T	F	T
T	F	T	T	F	T
T	F	F	F	T	T
F	T	T	T	F	F
F	T	F	T	F	F
F	F	T	T	F	F
F	F	F	F	T	T

42) w : The streets are wet

r : It is raining

1. $w \vee (\sim r)$

2. $(\sim w) \rightarrow (\sim r)$

w	r	$\sim w$	$\sim r$	$w \vee (\sim r)$	$(\sim w) \rightarrow (\sim r)$
T	T	F	F	T	T
T	F	F	T	T	T
F	T	T	F	F	F
F	F	T	T	T	T

Statements 1. and 2. are equivalent.

Section 1.4

6) Inverse: If you don't have the necessary tools, assembly time is more than 30 minutes

Converse: If assembly time is ~~more~~ ^{less} than 30 minutes, then you have the necessary tools

Contrapositive: If assembly time is more than 30 minutes, then you don't have the necessary tools

12) ~~Not being an author is sufficient~~

Not being literate is sufficient for not being an author

Not being an author is necessary for not being literate

30) i : I am illiterate

a : I can fill out an application form

1. $i \rightarrow (\sim a)$

2. $(\sim i) \rightarrow a$

Truth table

i	a	$\sim i$	$\sim a$	$i \rightarrow (\sim a)$ ①	$(\sim i) \rightarrow a$ ②
T	T	F	F	F	T
T	F	F	T	T	T
F	T	T	F	T	T
F	F	T	T	T	F

The statements are not equivalent

34) s : I buy seafood

f : The seafood is fresh

1. $s \rightarrow f$

2. $(\sim s) \rightarrow (\sim f)$

Truth table

s	f	$\sim s$	$\sim f$	$s \rightarrow f$	$(\sim s) \rightarrow (\sim f)$
T	T	F	F	T	T
T	F	F	T	F	T
F	T	T	F	T	F
F	F	T	T	T	T

The statements are not equivalent

