Assignment 1.1

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2.

a) Not a proposition

b) Not a proposition

c) Yes, truth value = false

d) Not a proposition

e) Yes, truth value = false

f) Not a proposition

14.

a) $r \wedge \neg q$

b) $p \wedge q \wedge r$

c) $r \rightarrow p$

d) $p \wedge \neg q \wedge r$

e) $(p \wedge q) \rightarrow r$

f) $r \leftrightarrow (p \vee q)$

24.

a) If you send me an email message, I will remember to send you the address

b) If you were born in the United States, then you are a citizen of this country.

c) Already in correct form

d) If their goalie plays well, the Red Wings will win the Stanley Cup.

e) If you get the job, then you had the best credentials.

f) If there's a storm, then the beach erodes.

g) If you log on to the server, then you have a valid password

h) If you begin your climb too late, then you will not reach the summit.

32.

a)

p	¬p	p → ¬p
T	F	F
F	T	T

b)

p	¬p	p ↔ ¬p
T	F	F
F	T	F

c)

p	q	p ∨ q	p ⊕ (p ∨ q)
T	T	T	F
T	F	T	F
F	T	T	T
F	F	F	F

d)

p	q	p ∧ q	p ∨ q	(p ∧ q) → (p ∨ q)
T	T	T	T	T
T	F	F	T	T
F	T	F	T	T
F	F	F	F	T

e)

p	q	¬p	q → ¬p	p ↔ q	(q → ¬p) ↔ (p ↔ q)
T	T	F	F	T	F
T	F	F	T	F	F
F	T	T	T	F	F
F	F	T	T	T	T

f)

p	q	p ↔ q	¬q	p ↔ ¬q	(p ↔ q) ⊕ (p ↔ ¬q)
T	T	T	F	F	T
T	F	F	T	T	T
F	T	F	F	T	T
F	F	T	T	F	T

36.

a)

p	q	r	p ∨ q	(p ∨ q) ∨ r
T	T	T	T	T
F	T	T	T	T
T	F	T	T	T
T	T	F	T	T
F	F	T	F	T
F	T	F	T	T
T	F	F	T	T
F	F	F	F	F

b)

p	q	r	p ∨ q	(p ∨ q) ∧ r
T	T	T	T	T
F	T	T	T	T
T	F	T	T	T
T	T	F	T	F
F	F	T	F	F
F	T	F	T	F
T	F	F	T	F
F	F	F	F	F

c)

p	q	r	p ∧ q	(p ∧ q) ∨ r
T	T	T	T	T
F	T	T	F	T
T	F	T	F	T
T	T	F	T	T
F	F	T	F	T
F	T	F	F	F
T	F	F	F	F
F	F	F	F	F

d)

p	q	r	p ∧ q	(p ∧ q) ∧ r
T	T	T	T	T
F	T	T	F	F
T	F	T	F	F
T	T	F	T	F
F	F	T	F	F
F	T	F	F	F
T	F	F	F	F
F	F	F	F	F

e)

p	q	r	p ∨ q	¬r	(p ∨ q) ∧ ¬r
T	T	T	T	F	F
F	T	T	T	F	F
T	F	T	T	F	F
T	T	F	T	T	T
F	F	T	F	F	F
F	T	F	T	T	T
T	F	F	T	T	T
F	F	F	F	T	F

f)

p	q	r	p ∧ q	¬r	(p ∧ q) ∨ ¬r
T	T	T	T	F	T
F	T	T	F	F	F
T	F	T	F	F	F
T	T	F	T	T	T
F	F	T	F	F	F
F	T	F	F	T	T
T	F	F	F	T	T
F	F	F	F	T	T