Solution 2

1.2

04. $w \to (d \vee s)$

22. a) $J \to \neg S \quad S \to K \quad \neg K \vee J$

b) If J is T, then S is F, then K can be not only T, but F.

c) If J is F, then K is F, then S is F.

So Three solution: Jasmine, Jasmine and Kanti, nobody.

36. p: Cooper was a friend of Jones and that Williams disliked him.

q: Jones did not know Cooper and that he was out of town the day Cooper was killed.

r: Williams saw both Smith and Jones with Cooper the day of the killing and that either Smith or Jones must have killed him.

a) 1) If p and q are T, that is impossible.

2) If p and r are T, then q is F.

3) If q and r are T, that is impossible.

So The murderer is **Jones**.

b) 1) From a), p and q can not be true at the same time, so r is T.

2) If r is T then q is F, and p is T.

So The murderer is **Jones**.

44. a) $\neg p \vee \neg q$

b) $\neg(p \vee (\neg p \wedge q))$

1.3

08. a) Kwame will not take a job in industry and will not go to graduate school.

b) Yoshiko dose not know Java or does not know calculus.

c) James is not young or is not strong.

d) Rita will not move to Oregon and will not move Washington.

28.

$$\begin{aligned}(p \to q) \vee (p \to r) &\equiv (\neg p \vee q) \vee (\neg p \vee r) \\ &\equiv \neg p \vee (q \vee r) \\ &\equiv p \to (q \vee r)\end{aligned}$$

38. a) $p \wedge \neg q$

b) $p \vee (q \wedge (r \vee F))$

c) $(p \vee \neg q) \wedge (q \vee T)$

40. $p \wedge p$ and $p \vee q$, only have a variable.

44. $p \wedge q \wedge \neg r$

52. Table 1.

Table 1:

p	q	$p \downarrow q$
F	F	T
F	T	F
T	F	F
T	T	F

58. Table 2.

Table 2:

p	q	r	$p \mid (q \mid r)$	$(p \mid q) \mid r$
F	F	F	T	T
F	F	T	T	F
F	T	F	T	T
F	T	T	T	F
T	F	F	F	T
T	F	T	F	F
T	T	F	F	T
T	T	T	T	T

62. 1) If the first and second is true, then p and q have the same value;

2) If p and q are T, then the third and fourth are T;

3) If the last is T, then r is F.

So p and q are T, r is F can be made that.