

$$1. (P \rightarrow q) \wedge \sim q \sim (P \vee q)$$

1	2	3	4	5	6	7
P	q	$P \rightarrow q$	$\sim q$	$(P \rightarrow q) \wedge \sim q$	$P \vee q$	$\sim(P \vee q)$
T	T	T	F	F	T	F
T	F	F	T	F	T	F
F	T	T	F	F	T	F
F	F	T	T	T	F	T

$$2. ((\sim P \vee \sim q) \rightarrow (P \wedge q \wedge r)) \leftrightarrow (P \wedge q)$$

1	2	3	4	5	6	7	8
P	q	r	$\sim P$	$\sim q$	$4 \vee 5$	$P \wedge q$	$P \wedge q \wedge r$
T	T	T	F	F	F	T	T
T	T	F	F	F	F	T	F
T	F	T	F	T	T	F	F
T	F	F	F	T	T	F	F
F	T	T	T	F	T	F	F
F	T	F	T	F	T	F	F
F	F	T	T	T	T	F	F
F	F	F	T	T	T	F	F

9

$$((\sim P \vee \sim q) \rightarrow (8))$$

$$9 \leftrightarrow 7$$

T

T

T

T

F

T

F

T

F

T

F

T

F

T

F

T

No.

Date.

3. $\sim (P \rightarrow (P \vee q))$

1	2	3	4
P	q	$P \vee q$	$\sim (P \rightarrow (3))$
T	T	T	F
T	F	T	F
F	T	T	F
F	F	F	F

4. $\sim (P \vee q) \leftrightarrow (\sim P \wedge \sim q)$

1	2	3	4	5	6	7
P	q	$\sim P$	$\sim q$	$\sim (P \vee q)$	$(3 \wedge 4)$	$5 \leftrightarrow 6$
T	T	F	F	F	F	T
T	F	F	T	F	F	T
F	T	T	F	F	F	T
F	F	T	T	T	T	T

5. $(P \rightarrow q) \rightarrow (\sim P \vee q)$

1	2	3	4	5	6
P	q	$\sim P$	$P \rightarrow q$	$\sim P \vee q$	$4 \leftrightarrow 5$
T	T	F	T	T	T
T	F	F	F	F	T
F	T	T	T	T	T
F	F	T	T	T	T