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1 Logic

1.1 Truth Table

- $p \vee \neg q$

p	q	$\neg q$	$p \vee \neg q$
T	T	F	T
T	F	T	T
F	T	F	F
F	F	T	T

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

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

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

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

1.2 Logical Equivalence

- $\neg p \rightarrow (q \vee r) \equiv p \vee q \vee r$

p	q	r	$\neg p$	$q \vee r$	$\neg p \rightarrow (q \vee r)$	$p \vee q \vee r$
T	T	T	F	T	T	T
T	T	F	F	T	T	T
T	F	T	F	T	T	T
T	F	F	F	F	T	T
F	T	T	T	T	T	T
F	T	F	T	T	T	T
F	F	T	T	T	T	T
F	F	F	T	F	F	F

- $\neg q \rightarrow (r \vee p) \equiv q \vee r \vee p$

p	q	r	$\neg q$	$r \vee p$	$\neg q \rightarrow (r \vee p)$	$p \vee q \vee r$
T	T	T	F	T	T	T
T	T	F	F	T	T	T
T	F	T	T	T	T	T
T	F	F	T	T	T	T
F	T	T	F	T	T	T
F	T	F	F	F	T	T
F	F	T	T	T	T	T
F	F	F	T	F	F	F

1.3 Argument

Hypotheses

- $p \vee q$
- r
- $r \rightarrow \neg q$

Conclusion

- p

$$p \vee q$$

$$r$$

$$r \rightarrow \neg q$$

$$p \vee q$$

$$\neg r$$

$$\neg r \vee \neg q$$

$$p \vee \neg q$$

$$\neg \neg q$$

$$p$$

cf)

$$H_1 \equiv p \vee q$$

$$H_2 \equiv r$$

$$H_3 \equiv r \rightarrow \neg q$$

p	q	r	$\neg q$	$p \vee q$	$r \rightarrow \neg q$	$H_1 \wedge H_2 \wedge H_3$	p
T	T	T	F	T	F	F	T
T	T	F	F	T	T	F	T
T	F	T	T	T	T	T	T
T	F	F	T	T	T	F	T
F	T	T	F	T	F	F	F
F	T	F	F	T	T	F	F
F	F	T	T	F	T	F	F
F	F	F	T	F	T	F	F