

10/4/21

ABDUL RAFEH CSC-20S-104

① $\neg p \vee \neg q$

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

② $\neg(\neg p \vee q)$

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

③ $(p \vee q) \vee (\neg q)$

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

④ $P \wedge (q \wedge r)$

P	q	r	$q \wedge r$	$P \wedge (q \wedge r)$
T	T	T	T	T
T	T	F	F	F
T	F	T	F	F
T	F	F	F	F
F	T	T	T	F
F	T	F	F	F
F	F	T	F	F
F	F	F	F	F

⑤ $P \wedge q$, where q is not true.

P	q	$P \wedge q$
T	F	F
T	F	F
F	F	F
F	F	F

⑥ $P \wedge q$, where $\neg q$ is not false.

P	q	$\neg q$	$P \wedge q$
T	T	F	T
T	F	T	F
F	T	T	F
F	F	T	F

⑦ $P \vee q$, where $\neg p$ is false.

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

⑧ $P \vee q$, where $\neg p$ is not true.

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

⑨ $p \rightarrow (p \vee q)$

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

⑩ $(p \wedge q) \rightarrow \neg p$

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

⑪ $(p \wedge q) \rightarrow (p \vee q)$

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

(12)

$$(P \vee q) \leftrightarrow (P \wedge q)$$

P	q	$P \vee q$	$P \wedge q$	$(P \vee q) \leftrightarrow (P \wedge q)$
T	T	T	T	T
T	F	T	F	F
F	T	T	F	F
F	F	F	F	T

$$(13) (P \vee q) \rightarrow r \equiv (P \rightarrow r) \wedge (q \rightarrow r)$$

P	q	r	$P \vee q$	$P \rightarrow r$	$q \rightarrow r$	$(P \vee q) \rightarrow r$	$(P \rightarrow r) \wedge (q \rightarrow r)$
T	T	T	T	T	T	T	T
T	T	F	T	F	F	F	F
T	F	T	T	T	T	T	T
T	F	F	T	F	T	F	F
F	T	T	T	T	F	F	F
F	T	F	T	F	F	F	F
F	F	T	F	T	T	T	T
F	F	F	F	T	T	T	T

Left side \leftarrow = \leftarrow Right side
equivalence.