

Solⁿ Tutorial-2

Date

Ans-1 :-

P	q	$P \rightarrow q$	$\neg P$	$P \leftrightarrow q$	$\neg P \vee (P \leftrightarrow q)$
T	T	T	F	T	T
T	F	F	F	F	F
F	T	T	T	F	T
F	F	T	T	T	T

from the table if $P \rightarrow q$ is true then $\neg P \vee (P \leftrightarrow q)$ is true.

Ans-2 :- 16

Ans-3 :- Converse: If I am not the Prime Minister of India then $2+2=4$.

Inverse: If $2+2 \neq 4$ then I am ~~not~~ Prime Minister of India.

Contrapositive: If I am Prime Minister of India then $2+2 \neq 4$.

Ans-4 :- (a) $P \wedge q$

(b) $P \vee q$

(c) $\neg(P \wedge q)$

(d) $\neg P \wedge \neg q$

(e) $(P \wedge \neg q) \vee (\neg P \wedge q)$

Ans-5 :- (a) It is false that $2+7 < 13$

(b) Some nice people are dangerous.

Ans

Ques-6 :- (a) Ravi is poor but happy.

(b) Ravi is rich or unhappy.

(c) Ravi is neither rich nor unhappy.

(d) Ravi is poor or he is both rich and unhappy.

Ans-7 :- (a) True (b) True.

Ans-8 :- (a) $[P \wedge (P \rightarrow Q)] \rightarrow Q$ all True

(b) All true.

(c) $(P \rightarrow Q) \wedge (\neg P \rightarrow r)$

P	Q	r	$\neg P$	$P \rightarrow Q$	$\neg P \rightarrow r$	$(P \rightarrow Q) \wedge (\neg P \rightarrow r)$
T	T	T	F	T	T	T
T	T	F	F	T	T	T
T	F	T	F	F	T	F
T	F	F	F	F	T	F
F	T	T	T	T	T	T
F	T	F	T	T	F	F
F	F	T	T	T	T	T
F	F	F	T	T	F	F

(d) $(P \leftrightarrow Q) \vee (\neg Q \leftrightarrow r)$

P	Q	r	$P \leftrightarrow Q$	$\neg Q$	$\neg Q \leftrightarrow r$	$(P \leftrightarrow Q) \vee (\neg Q \leftrightarrow r)$
T	T	T	T	F	F	T
T	T	F	T	F	T	T
T	F	T	F	T	T	T
T	F	F	F	T	F	F
F	T	T	F	F	F	F
F	T	F	F	F	T	T
F	F	T	T	T	T	T
F	F	F	T	T	F	F

$$(e) (\neg p \leftrightarrow \neg q) \leftrightarrow (q \leftrightarrow r)$$

p	q	r	$\neg p$	$\neg q$	$(\neg p \leftrightarrow \neg q)$	$(q \leftrightarrow r)$	$(\neg p \leftrightarrow \neg q) \leftrightarrow (q \leftrightarrow r)$
T	T	T	F	F	T	T	T
T	T	F	F	F	T	F	F
T	F	T	F	T	F	F	T
T	F	F	F	T	F	T	F
F	T	T	T	F	F	T	F
F	T	F	T	F	F	F	T
F	F	T	T	T	T	F	F
F	F	F	T	T	T	T	T