

4. (a)

P	Q	R	$Q \implies R$	$P \vee (Q \implies R)$
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1	1	1	1	1
1	1	0	0	1
1	0	1	1	1
1	0	0	1	1
0	1	1	1	1
0	1	0	0	0
0	0	1	1	1
0	0	0	1	1

(b)

P	Q	$\neg P$	$(P \wedge \neg P)$	$(P \wedge \neg P) \vee Q$
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1	1	0	0	1
1	0	0	0	0
0	1	1	0	1
0	0	1	0	0

The statement reduces to Q .

(c)

P	Q	$\neg P$	$(P \vee \neg P)$	$(P \vee \neg P) \wedge Q$
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1	1	0	1	1
1	0	0	1	0
0	1	1	1	1
0	0	1	1	0

The statement reduces to Q again.