x odd x^2 odd

suf   nec

$p \to q$ ✓

* +

$p \to q$

$q \to p$

p	q	$p \Leftrightarrow q$
0	0	1
0	1	0
1	0	0
1	1	1

sufficient necessary

p	q	$p \to q$
0	0	1
0	1	1
1	0	0
1	1	1

$(t \wedge \neg u) \to s$

$t \to (\neg u \to s)$

$\neg(s \leftrightarrow (u \vee t))$

$s \leftrightarrow t$

$(u \wedge \neg t) \rightarrow \neg s$

$u \wedge s$

$p \vee (q \wedge r)$

$(p \wedge q) \vee (t \wedge u)$

$* \quad + \quad *$

p	q	r	$q \wedge r$	$p \vee (q \wedge r)$	$p \vee q$	$(p \vee q) \wedge r$
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	0	0	0	1	0
0	1	1	1	1	1	1
1	0	0	0	1	1	0
1	0	1	0	1	1	1
1	1	0	0	1	1	0
1	1	1	1	1	1	1

3SAT $(x_1 \vee x_2 \vee x_3) \wedge ($

Distributive Law

$5(2+3)$ ✓ $\qquad$ × $\cancel{4 + (2 \cdot 3)}$

$5 \cdot 2 + 5 \cdot 3$ $\qquad$ $\cancel{(4+2)(4+3)}$

$(p \vee q) \to r$ $\qquad$ SoP $\quad$ PoS

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

Karnaugh maps →

pq \ r	0	1
00	1	1
01	0	1
11	0	1
10	0	1

$(p \vee q) \to r$

$\neg (p \vee q) \vee r$

$(\neg p \wedge \neg r) \vee r$

=

$p \to q$

$\neg p \to \neg p$ inv

=

$q \to p$ conv

$\neg q \to \neg p$ Contraposition