LM ser fácil é condição suficiente para eu gostar.

P = LM é fácil
Q = Gosto de LM

$P \rightarrow Q$

$P \rightarrow Q \iff \neg Q \rightarrow \neg P$

$\neg P \vee Q \iff$

$Q \vee \neg P \iff$

$\neg Q \rightarrow \neg P$

CONTRA-positiva

SUFICIENTE

NECESSÁRIO

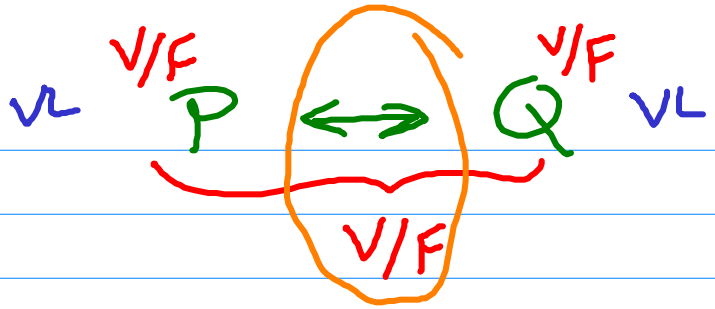
$P \rightarrow Q$

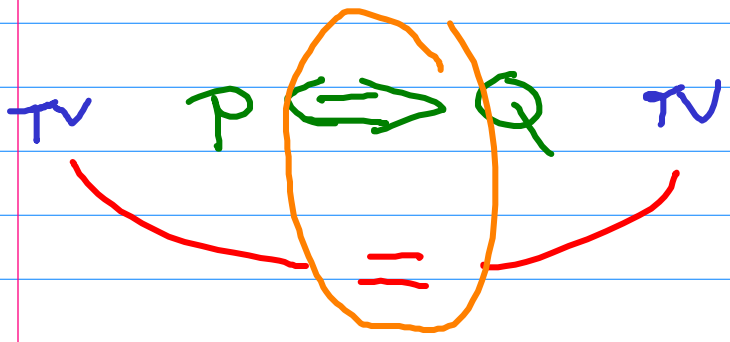
SUFICIENTE E NECESSÁRIO

$P \leftrightarrow Q$.

SUFICIENTE E NECESSÁRIO

$Q \leftrightarrow P$.





VÁLIDO OU NÃO VÁLIDO

$\neg P \leftrightarrow \neg Q$.

P	Q	$P \leftrightarrow Q$	$\neg P$	$\neg P \leftrightarrow Q$
V	V	V	F	F
V	F	F	F	V
F	V	F	V	V
F	F	V	V	F

$Q \leftrightarrow P$.

$= \neg$

$\neg(P \leftrightarrow Q) \Leftrightarrow (\neg P \leftrightarrow Q)$

$\Leftrightarrow (P \leftrightarrow \neg Q)$

$\vdots$

$\neg(P \vee Q) \Leftrightarrow \neg P \wedge \neg Q$ ✓

$\neg(P \leftrightarrow Q) \Leftrightarrow \neg P \leftrightarrow Q$ ✓

$a \vee (b \vee c \vee d)$

$(P \vee Q) \rightarrow ((P \wedge Q) \vee (P \wedge \neg Q) \vee (\neg P \wedge Q)) \Leftrightarrow$

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

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

$A \wedge (B \vee C) \Leftrightarrow (A \wedge B) \vee (A \wedge C)$

$A \vee (B \wedge C) \Leftrightarrow (A \vee B) \wedge (A \vee C)$

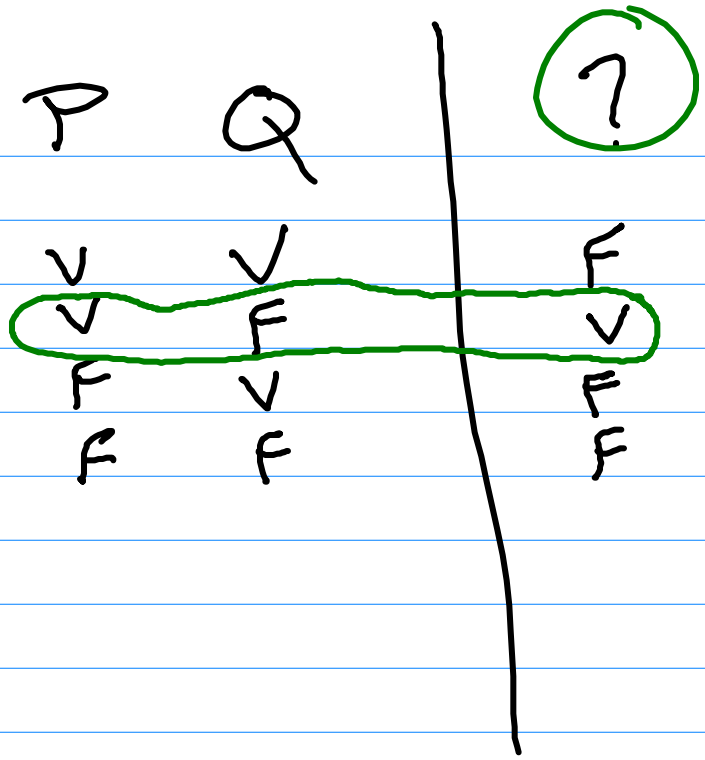
$[(P \wedge Q) \vee (P \wedge \neg Q)] \vee [(\neg P \wedge Q) \vee (\neg P \wedge \neg Q)]$

$[P \wedge \overbrace{(Q \vee \neg Q)}^{a}]^{b} \vee [\neg P \wedge \overbrace{(Q \vee \neg Q)}^{a}]^{b}$

$\underbrace{P \vee \neg P}_{\vee}$

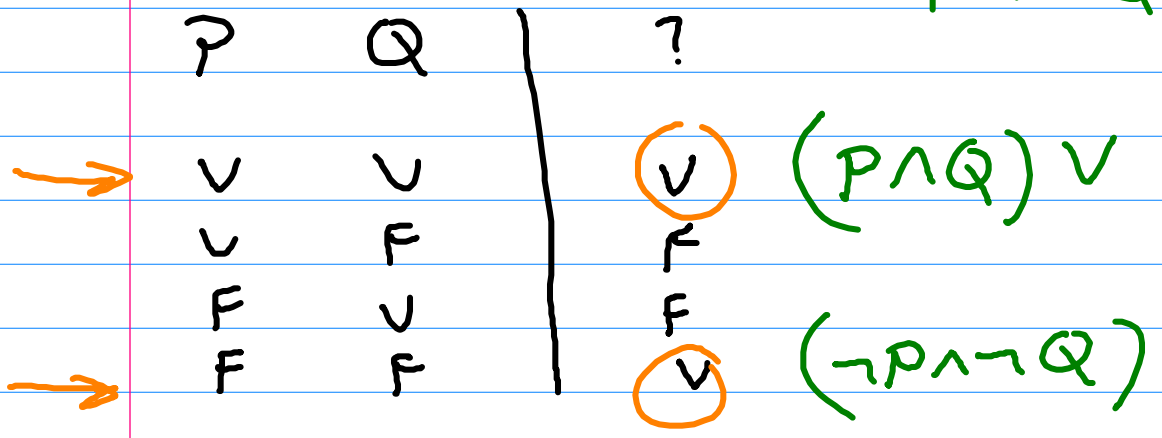
$\vee$

a	b	a ∧ b
V	V	V
V	F	F

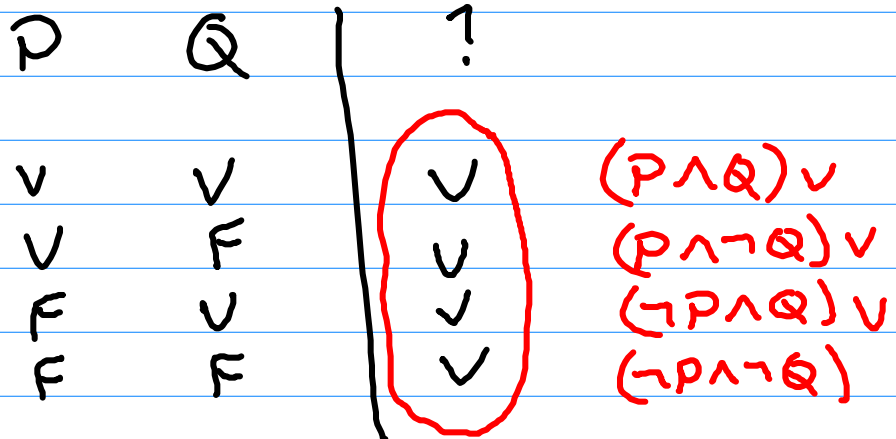


$P \wedge \neg Q$

$P \leftrightarrow Q$



$P \leftrightarrow Q \iff (P \wedge Q) \vee (\neg P \wedge \neg Q)$



P	Q	$P \veebar Q$	$P \vee Q$	$P \leftrightarrow Q$
V	V	F	V	V
V	F	V	V	F
F	V	V	V	F
F	F	F	F	V

$\neg(P \leftrightarrow Q) \iff P \veebar Q$

$\neg P \leftrightarrow Q \iff P \veebar Q$

$P \veebar Q \iff (P \wedge \neg Q) \vee (\neg P \wedge Q)$

P	Q	$P \veebar Q$
V	V	F
V	F	V
F	V	V
F	F	F

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