Another Example

① $M \wedge A \longrightarrow (S \to L)$

② $M \wedge \sim A \to \sim L$

③ $C \to (B \leftrightarrow L)$

$M \wedge C \to (A \wedge B) \vee (\sim A \wedge \sim B)$

—

$M \wedge C$ is true

and $(A \wedge B) \vee (\sim A \wedge \sim B)$ is true

— $M \wedge C \to (A \wedge B) \vee (\sim A \wedge \sim B)$ is true.

—

C is true, it implies

$(B \leftrightarrow L)$ is true for $C \to (B \leftrightarrow L)$ to be true.

$B \leftrightarrow L$ is true when

B and L is true.

Or B and L both false.

- ~~If~~ when L is true, then $\sim L$ is false.
This implies. $M \wedge \sim A$ must be false

so for $M \wedge \sim A \to \sim L$.

If A is true, ~~then~~ it implies $M \wedge \sim A$ is false.

M is true and ~~sup~~ also A then $M \wedge A$ is true. It ~~means~~ implies $S \to L$ must be true.

$S \to L$ is always true when L is true.

When A, M, B, L, C are true all the three statements are true.

~~Ma~~ $M \wedge C$ is true.

A and B is true so

$(A \wedge B) \vee (\sim A \wedge \sim B)$ is also true.

Quantifiers and Context

For example $x^2=1$, is either statement true for all integers.

we need to specify the set. (context).

~~$\exists$, for all values.~~

$\exists$: there exists, for some (existential quantifier)

$\forall$: for all, for every. (universal quantifier).

There exists an integer x such that $x^2=1$.

$x^2=1$ is true for $x=1$ and $x=-1$ both of them are integers.

$(\exists x)(x\in I)(x^2=1)$ (In symbols)

Examples of quantifiers:

For every integer x, there exists an integer y such that $x+y=0$.

$(\forall x)(\exists y)(x+y=0)$.

Explanation: Take any integer x. 10, ~~then~~, $x=10$, $y=-10$, $x+y=10$

This is true statement:

~~For~~ There exists an integer y, such that for every integer x, then $x+y=0$

$$(\exists y)(\forall x)(x+y=0)$$

Take any two integers 10, 20, $x=10$, $x=20$.
~~and fix~~ can we have a same y such that $10+y=0$, and $20+y=0$
- Not possible. So the above statement is false.

- The sequence of quantifiers ~~are~~ is very important. It changes the meaning.