

Math 321

How To do the textbook examples.

write question \rightarrow close book \rightarrow do it \rightarrow check

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

argument when is this true? \square \wedge \circ

- ① to be T both \square and \circ are true.
- ② for the \circ 's to be true at least one part is true.

\square says p or q or r is true
 \circ says p or q or r is false

when is this false? \rightarrow all p, q, r are same truth value

1.2 Applications

① Arguments: know truth tables well

\square truth table everyone should know

p	q	$\neg p$	$\neg q$	$p \wedge q$	$p \vee q$	$p \oplus q$	$p \rightarrow q$	$p \leftrightarrow q$
T	T	F	F	T	T	F	T	T
T	F	F	T	F	T	T	F	F
F	T	T	F	F	T	T	T	F
F	F	T	T	F	F	T	T	T

② Eng \leftrightarrow Sym

f $\left[\frac{\text{the mouse eats candy}}{\text{}} \right]$, then $\left[\frac{\text{Mark runs fast.}}{\text{}} \right]$

C : "the mouse eats candy"

F : "Mark runs fast"

$C \rightarrow F$

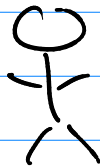
the mouse eats candy, only if Mark runs fast.

C	F	$C \rightarrow F$	$F \rightarrow C$	$\neg(F \leftrightarrow C)$	$F \oplus C$
T	T	T	T	F	F
T	F	F	F	T	T
F	T	T	F	T	T
F	F	T	T	F	F

③ Logic Puzzles

$\left[\frac{\text{Death}}{\text{}} \right]$

$\left[\frac{\text{Life}}{\text{}} \right]$



"which way would you go?"

Liar: point to death

Truth: point to life

Same?

compare prop. #1

(vs) compare prop #2

(ex) $\neg (p \leftrightarrow q)$ vs $(p \oplus q)$

p	q	$p \oplus q$
T	T	F
T	F	T
F	T	T
F	F	F