Math 321

How To do the textbook examples.

write question → close book → do it → check

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

argument when is this true? $\square \wedge \bigcirc$

① to be T both $\square$ and $\bigcirc$ are True.

② for the ors to be true at least one part is true.

and $\square$ says p or q or r is true

$\bigcirc$ says p or q or r is false

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

1.2 Applications

① Arguments: know truth tables well

ex truth table everyone should know

p	q	¬p	¬q	p ∧ q	p ∨ q	p ⊕ q	p → q	p ↔ q
T	T						T	
T	F						F	
F	T						T	
F	F						T	

② eng $\rightleftharpoons$ sym

if [the mouse eats candy], then [Mark runs fast.]

C : "the mouse eats candy"
F : "Mark runs fast"

$C \rightarrow F$

the mouse eats candy, only if Mark runs fast.

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

③ Logic Puzzles

[Death] [life]

"which way would you go?"

Liar: point to death

Truth: point to life

Same?

compound prop. #1 (vs) compound 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