1.1 Exercise.

Chapter 1. Sentential Logic (Propositional Logic).

Deductive Reasoning & Logical Connectors.

R: It will rain tomorrow.

P: There exist infinite many nature numbers such that.

n and $n+2$ are prime.

S: It will snow tmr.

R or S : It will rain or snow tomorrow.

Logical Connectors: or => $\vee$ deny => $\neg$.

and => $\wedge$

$R \vee S$, $R \wedge S$: $\neg(R \wedge S) \equiv \neg R \vee \neg S$.

Translate to Symbols:

Either ... or ... $\vee$ (same as or, but you know where to add a bracket).

De Morgan's law:

$\neg(R \vee S) \equiv \neg R \wedge \neg S$.

$3 \leq \pi$ can be says as $(3 < \pi) \vee (3 = \pi)$

$3 \leq \pi \leq 4$ ---- $[(3 < \pi) \vee (3 = \pi)] \wedge [(4 > \pi) \vee (4 = \pi)]$.

Well formed Formula.

e.g. $\neg \wedge P$ ✗ $P \wedge \vee Q$ ✗

$(P \wedge Q$ ✗

The truth table

P	Q	P∨Q	P∧Q	¬P	¬Q	¬(P∧Q)	¬P∨¬Q
T	T	T	T	F	F	F	F
T	F	T	F	F	T	T	T
F	T	T	F	T	F	T	T
F	F	F	F	T	T	T	T

=> ¬(P∧Q) ≡ ¬P∨¬Q.

P∨(P∧Q)

T

T

F

F

=> P∨(P∧Q) ≡ P.

3 boxes, labeled A, O, A mixed O

You known none of these box is labeled correctly.

Open one