

ASSUMING NO PARENTHESES HAS BEEN DROPPED, PROVE THAT THE

FOLLOWING SEQUENCES OF SYMBOLS ARE NOT FORMULAS OF PL

a) $x \wedge y$ NOT A FORMULA

BECAUSE THE FORMATION RULE IS $(x \wedge y)$

b) (x) NOT A FORMULA

BECAUSE THE PARENTHESES EXCLUDES THE DEALING WITH VARIABLES

c) $(x \rightarrow (\rightarrow y))$ NOT A FORMULA

BECAUSE THE FORMATION RULE IS $(A \square (B \square C)). B?$

USING ABBREVIATIONS P: THE PRESSURE OF THE GAS REMAIN CONSTANT,
V: THE VOLUME OF THE GAS REMAIN CONSTANT T: THE TEMPERATURE OF THE
GAS REMAIN CONSTANT, TRANSLATE THE GIVEN FORMULAS FROM PL TO NATURAL
LANGUAGE

a) $P \wedge V \rightarrow T$

IF THE PRESSURE OF THE GAS REMAIN CONSTANT AND THE VOLUME OF THE
GAS REMAIN CONSTANT, THEN THE TEMPERATURE OF THE GAS REMAIN CONSTANT

b) $\neg P \rightarrow (V \rightarrow \neg T)$

IF THE PRESSURE OF THE GAS DO NOT REMAIN CONSTANT, THEN IF THE VOLUME
OF THE GAS REMAIN CONSTANT THEN THE TEMPERATURE OF THE GAS NO NOT
REMAIN CONSTANT

c) $\neg T \rightarrow (\neg P \vee \neg V)$

IF THE TEMPERATURE OF THE GAS DO NOT REMAIN CONSTANT, THEN EITHER THE
PRESSURE OR THE VOLUME DO NOT REMAIN CONSTAM

d) $T \rightarrow ((P \wedge V) \vee (\neg P \wedge \neg V))$

IF THE TEMPERATURE OF THE GAS REMAIN CONSTAM, THEN EITHER BOTH PRESSURE
AND VOLUME REMAIN CONSTAM OR BOTH OF THEM DO NOT

e) $T \rightarrow ((\neg P \rightarrow \neg V) \wedge (P \rightarrow V))$

IF THE TEMPERATURE OF THE GAS REMAIN CONSTAM, THEN IF THE PRESSURE DON'T
REMAIN CONSTAM THEN THE VOLUME DO NOT REMAIN CONSTAM AND IF THE
PRESSURE REMAIN CONSTAM THEN THE VOLUME REMAIN CONSTAM

TRANSLATE THE FOLLOWING ARGUMENTS INTO A SUITABLE PROPOSITIONAL

(2) IF THE VALUATION τ SATISFIES $\varphi \rightarrow \psi$, THEN τ SATISFIES φ ONLY IF
 IT SATISFIES ψ . IN ADDITION, τ SATISFIES ψ ONLY IF IT DOES NOT
 SATISFY φ . THEREFORE, τ SATISFIES $\varphi \rightarrow \psi$ IF ...

1. CHOICE FOR VARIABLES

Z = THE VALUATION τ SATISFIES $\varphi \rightarrow \psi$

Y = THE VALUATION τ SATISFIES φ

X = THE VALUATION τ SATISFIES ψ

2. SUBSTITUTIONS

IF Z , THEN (Y IF X). IN ADDITION, X IF Z IFF $\neg Y$. THEREFORE, Z IF ...

3. CONNECTIVES

$Z \rightarrow (X \rightarrow Y) \wedge (Z \leftrightarrow \neg Y) \rightarrow X \models _ \Rightarrow Z \dots$

b) IF THE DEMAND FOR GOODS WILL INCREASE, THEN THERE WILL BE
 ECONOMIC INSTABILITY IF IMPORTS WILL GROW. IF THE DEMAND
 FOR GOODS WILL INCREASE OR THERE WILL BE ECONOMIC INSTABILITY,
 THEN IMPORT WILL GROW. IF EITHER DEMAND FOR GOODS WILL INCREASE
 IF IMPORTS WILL GROW OR DEMAND FOR GOODS WILL INCREASE IF
 THERE WILL BE ECONOMIC INSTABILITY, THEN DEMAND FOR GOODS