

WILL INCREASE ANYWAY. THEREFORE, THERE WILL BE ECONOMIC INSTABILITY IF THE DEMANDS FOR GOODS WILL INCREASE (F AND ONLY IF IMPORTS WILL GROW.

## 1. CHOICE FOR VARIABLES

$Z = \text{DEMANDS FOR GOODS WILL INCREASE}$

$Y = \text{THERE WILL BE ECONOMIC INSTABILITY}$

$X = \text{IMPORTS WILL GROW}$

## 2. SUBSTITUTIONS

IF  $Z$ , THEN  $(Y \text{ IF } X)$ . IF  $Z \text{ OR } Y$ , THEN  $X$ . IF [EITHER  $(Z \text{ IF } X)$  OR  $(Z \text{ IF } Y)$ ], THEN  $Z$ . THEREFORE,  $Y \text{ IF } (Z \text{ IFF } X)$ .

## REORDINATE THE SENTENCES

IF  $Z$ , THEN  $(\text{IF } X \text{ THEN } Y)$ . IF  $(Z \text{ OR } Y)$  THEN  $X$ .

ASSUMPTION: "EITHER... OR..." : "AT LEAST ONE IS TRUE"

IF  $[(\text{IF } X \text{ THEN } Z) \text{ OR } (\text{IF } Y \text{ THEN } Z)]$  THEN  $Z$ . THEREFORE, IF  $(Z \text{ IFF } X)$  THEN  $Y$

## 3. CONNECTIVES

$$Z \rightarrow (X \rightarrow Y), (Z \vee Y) \rightarrow X, [(X \rightarrow Z) \vee (Y \rightarrow Z)] \rightarrow Z \models (Z \Leftarrow X) \rightarrow Y$$

## EXTRA: SUBSTITUTION

$$\varphi : P \rightarrow \neg(P \vee (q \wedge P)) \quad \psi = r \vee \neg q \quad \varphi[\psi/P]?$$

$$\varphi[\psi/P] = (P \rightarrow \neg(P \vee (q \wedge P))) [r \vee \neg q / P] =$$

$$= P [r \vee \neg q / P] \rightarrow (\neg(P \vee (q \wedge P))) [r \vee \neg q / P]$$

$$= (r \vee \neg q \rightarrow (\neg(r \vee \neg q) \vee (q \wedge (r \vee \neg q))))$$

! Notice: Based on our needs, we can define the substitution as we prefer. As an example, instead of  $\varphi[\psi/P]$  we might look for  $\varphi[\psi/P]$ .

# CONSTRUCT TRUTH TABLE FOR THE FOLLOWING FORMULAS

(a)  $X \vee Y \rightarrow \neg X$

IN ORDER TO FIND ALL THE REQUIRED SUBFORMULAS, WE FIRST  
CONSTRUCT THE FORMATION TREE

$X \vee Y \rightarrow \neg X$

$X$	$Y$	$X \vee Y$	$\neg X$	$X \vee Y \rightarrow \neg X$
0	0	0	1	1
0	1	1	1	1
1	0	1	0	0
1	1	1	0	0