

Lab for Sections 3.4

Name _____

Use good notation and show appropriate work.

1. Use the valid and invalid forms as listed on page 114 of your textbook or on the handout. In each (i) identify the form that applies, and (ii) indicate whether the argument is valid or invalid.

- (a) The cook cooks only if the eater eats.
The eater eats.
Therefore, the cook cooks.
- (b) The soup is vegetable or tomato.
The soup is not tomato.
Therefore, the soup is vegetable.
- (c) The soup sticks to the bottom of the pan unless the soup is stirred.
The soup is not stirred.
Therefore, the soup sticks to the bottom of the pan.

2. Write formal proofs in the form of a T-proof.

- (a) Following is a possible list of statements in a formal proof of the argument form:

$$\begin{array}{l} p \rightarrow q \\ \sim q \\ \hline p \vee s \\ \hline \therefore s \end{array}$$

Provide reasons for each statement.

| <u>Statement</u> | <u>Reason</u> |
|--------------------------------|---------------|
| 1. $p \rightarrow q$ | |
| 2. $p \vee s$ | |
| 3. $\sim p \rightarrow s$ | |
| 4. $\sim q \rightarrow \sim p$ | |
| 5. $\sim q \rightarrow s$ | |
| 6. $\sim q$ | |
| 7. $\therefore s$ | |

$$(b) \quad \frac{\sim(p \wedge q)}{p} \\ \therefore \sim q$$

$$(c) \quad \frac{d \rightarrow z \\ z \rightarrow w \\ r \rightarrow \sim w}{d} \\ \therefore \sim r$$

3. First write the argument in symbolic form and then construct a formal proof (T-proof).

If prices are high, then wages are high.

Prices are high or there are price controls.

If there are price controls, then there is not inflation.

There is inflation.

Therefore, wages are high.