M260 2.3

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Valid and Invalid Arguments

An argument is a sequence of _____. The final

_____ is called the _____. The other _____

are called the _____.

An argument form is valid means no matter what _____ are

substituted for the _____, if the resulting

_____ are all true then the _____ is _____.

An argument is valid if its _____.

List the steps in testing an argument for validity.

1. _____

2. . _____

3. _____

4. _____

5. _____

Construct a truth table for the argument form below. Be carefully label the premises and conclusion:

$p \vee (q \vee r)$;

$\sim r$;

$\therefore p \vee q$

p q r				

Is the argument form valid?_____

Construct a truth table for the argument form:
$p \rightarrow q \vee \sim r$;
$q \rightarrow p \wedge r$;
$\therefore p \rightarrow r$

p q r				

Is the argument form valid?_____

List the standard rules of inference:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Give the rules of inference in symbolic form using p, q, and r for statement variables:

Modus Ponens:

Modus Tollens:

Generalization:

Specialization:

Elimination:

Transitivity:

Division into Cases:

Rule of Contradiction:

Write an example for each of the rules of inference:
Modus Ponens:

Modus Tollens:

Generalization:

Specialization:

Elimination:

Transitivity:

Division into Cases:

Rule of Contradiction:

Inference Example

Where are my glasses?

•a. If my glasses are on the kitchen table, then I saw them at breakfast.
•b. I was reading the newspaper in the living room or I was reading the newspaper in the kitchen.
•c. If I was reading the newspaper in the living room, then my glasses are on the coffee table.
•d. I did not see my glasses at breakfast.
•e. If I was reading my book in bed, then my glasses are on the bed table.
•f. If I was reading the newspaper in the kitchen, then my glasses are on the kitchen table

Assign statement variables for the underlined statements:

p = _____

q = _____

r = _____

s = _____

t = _____

u = _____

v = _____

Which are the target statements? _____

Express statements a through f in terms of the statement variables:

a. _____ d._____

b. _____ e. _____

c. _____ f. _____

Identify a given statement, prior argument, or rule of inference to justify each step of the deductive sequence:

•1. $p \rightarrow q$ from ( )

$\sim q$ from ( )

$\therefore \sim p$ by _____

•2. $s \rightarrow p$ from ( )

$\sim p$ from ( )

$\therefore \sim s$ by_____

•3. $r \vee s$ from ( )

$\sim s$ from ( )

$\therefore r$ by_____

•4. $r \rightarrow t$ from ( )

r from ( )

$\therefore t$ by_____

The converse error argument form:

Make a truth table to illustrate the converse error argument.

Give an example of the converse error:

The inverse error argument form:

Make a truth table to illustrate the inverse error argument.

Give an example of the inverse error:

Contradiction Rule: If the supposition that p is _____ leads to a contradiction then p is _____.