

Question 1

Write each of the following arguments in argument form (i.e., using propositions, predicates, quantifiers, and logical operators). Then, use the rules of inference to prove that each argument is valid. You must indicate the name of the rule used in each step of the proof.

The problem

Q1.1 If I am in New York, then I won't get a hot dog. I am in New York or Chicago. I will get some mustard and a hot dog. Therefore, I am in Chicago or Germany

let c be "I am in Chicago", n be "I am in New York", g be "I am in Germany", h be "I will get a hot dog", m be "I will get some mustard"

Compound Logic Form: $(n \rightarrow \neg h) \wedge (n \vee c) \wedge (m \wedge h) \rightarrow (c \vee g)$

Argument Form:

$$\begin{array}{l} n \rightarrow \neg h \\ n \vee c \\ m \wedge h \\ \hline \therefore c \vee g \end{array}$$

Validate Argument:

Proof.

1.	$n \rightarrow \neg h$	Hypothesis
2.	$n \vee c$	Hypothesis
3.	$m \wedge h$	Hypothesis
4.	n	Assumption
5.	$\neg h$	Modus Ponens 1, 4
6.	h	Simplification 3
7.	\perp	Contradiction 5, 6
8.	c	Negation Introduction 4-7
9.	$c \vee g$	Addition 8
10.	$\boxed{c \vee g}$	Disjunctive Syllogism 2, 9

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