Math 321

Q's / $W(\square, \triangle)$: "$\square$ has visited $\triangle$"

Univ. of Discourse

$\square$ is students @ WSU
$\triangle$ is websites.

ex $W(\text{Mark}, \text{google.com})$

"Mark has visited google.com"

(e) $\boxed{\exists t \, \forall z} \, \{ t \neq (\text{David}) \wedge [W(\text{David}, z) \longrightarrow W(t,z)] \}$

website.

student

$\left(\begin{array}{c} \text{listen to lecture} \\ \text{to get the english sentences} \end{array} \right)$

(1.5) Useful Truths

Arguments : use things that are true,

(no false allowed, within reason)

Mathematical Argument

$$\{p_1 \wedge p_2 \wedge \dots \wedge p_n\} \rightarrow q$$

premises   Conclusion

Note: If a premise is not given but assumed. This is an Enthymene

Note: an Argument is valid if

$$\{\{p_1 \wedge p_2 \wedge \dots \wedge p_n\} \rightarrow q\} \equiv T$$

if all p_i are T then q is T

Valid Argument

Def: Argument form is an argument that is valid and it only uses propositional variables.

Rules of Inference

tautology

$$[(p \to q) \wedge p] \to q$$

$$\begin{array}{c} p \to q \\ p \\ \hline \therefore q \end{array}$$

Affirming the hyp.
or
Modus Ponens

$$[(p \to q) \wedge \neg q] \to \neg p$$

$$\begin{array}{c} p \to q \\ \neg q \\ \hline \therefore \neg p \end{array}$$

Denying the conclusion
or
Modus Tollens

$$\begin{array}{c} p \to q \\ q \to r \\ \hline \therefore p \to r \end{array}$$
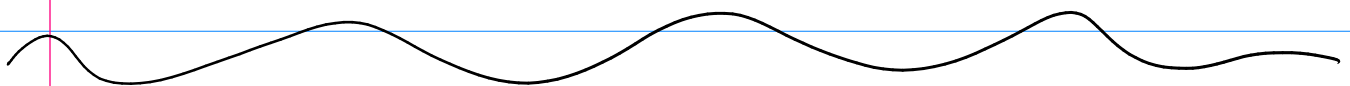
hypothetical
Syllogism

$$\begin{array}{c} p \vee q \\ \neg p \\ \hline \therefore q \end{array}$$

disjunctive
Syllogism

(etc)   p.66

Fallicies : non-valid argument that people tend to pass off as valid.

(ex) $\dfrac{\begin{array}{c} P \to q \\ \neg p \end{array}}{\therefore \neg q}$ bad! 　 Fallacy of denying hyp.

(ex) $\dfrac{\begin{array}{c} P \to q \\ q \end{array}}{\therefore p}$ bad! 　 Fallacy of affirm. conc.

(ex) Circular Reasoning. Assume Conclusion is T.