

**Class 5:
Diagrammatic Reasoning
Briefly; Resolution;
Midterm**

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June 1, 1999

- Logistics
 - Project 2: p1 up to and including, I believe, 18.27
 - Project 3: p1
 - * “fancy” options TBA (also: contact me)

- “Proving” God’s existence
- Diagrammatic Reasoning
 - mental imagery: hard!
 - mere diagrams vs. TEMIs
 - BRUTUS.1 “cheats” — Weak AI!
 - Hyperproof example *Hyperproof*
 - huge opportunities in this area

Remarks on Resolution

$$\begin{array}{ll} \Phi & \text{with } \phi \in \Phi \\ \Psi & \text{with } \neg\phi \in \Psi \end{array}$$

$$(\Phi - \{\phi\}) \cup (\Psi - \{\neg\phi\})$$

$$\frac{\phi \vee \psi \quad \neg\psi \vee \chi}{\phi \vee \chi}$$

$$\Phi_1 \cup \{\neg\psi_1, \neg\psi_2, \dots, \neg\psi_n\} \quad \text{all } \Phi_j \text{ positive}$$

$$\Phi_2 \cup \{\psi_{i_1}, \psi_{i_2}, \dots, \psi_{i_k}\} \quad 0 \leq i_k \leq n$$

⋮

$$\Phi_{n+1} \cup \{\psi_{i_1}, \psi_{i_2}, \dots, \psi_{i_m}\} \quad 0 \leq i_m \leq n$$

$$\Phi_1 \cup \Phi_2 \cup \dots \cup \Phi_{n+1}$$

Example from OTTER

----- PROOF -----

1 [] p|q| -r|s.
2 [] p|q|r.
3 [] -s.
4 [] -q.
5 [] -p.
6 [ur,5,1,4,3] -r.
7 [hyper,2,6] p|q.
8 [hyper,7,4] p.
9 [binary,8.1,5.1] \$F.

----- end of proof -----

- Midterm review *JR, Ralph*
- :
- And now the Midterm itself