Extra Credit

Due by **10:30 a.m. on Thursday, August 10th**. I **will not** accept any late extra credit submissions, unless you supply documentation of an illness or family emergency.

Please either write neatly in dark ink (not pencil) or type.
If you type:

- You will get an exciting stamp of thanks. (It won't say "Thanks". It will be much more exciting.)
- You are welcome to submit your work via e-mail as a PDF.

You may not discuss these questions with anyone else. The work you submit must be your own. If there is the slightest doubt as to whether the work you submit is your own, I may revoke this extra credit assignment for everyone.

This extra credit assignment is optional but strongly recommended, especially if you scored under a C on the first exam or either problem set. The questions on this assignment will be graded out of 55 points. For each point you earn, your exam grade will be raised by taking the amount of points you missed on the exam and multiplying that amount against the amount of points you get on this assignment (treating, however, the points from this assignment as a percentage of the possible points you can earn back). In other words, you can earn (up to) 55% of the points you missed on the exam / problem set.

Examples:

Old Exam / PS Grade	Points Lost	Earned points on this assignment (out of 55 points)	Points Added	New Exam Grade
75	100 - 75 = **25**	25	25 x 0.25 = 6.25	75 + 6.25 = **81.25**
75	100 - 75 = **25**	55	25 x .55 = 13.75	75 + 13.75 = **88.75**
63	100 - 60 = **40**	25	40 x .25 = 10	63 + 10 = **73**
63	100 - 60 = **40**	55	40 x .55 = 22	63 + 22 = **85**

Proofs:

Use the 8 rules of inference **ONLY** to derive the following conclusions (i.e. do **NOT** use the 10 rules of replacement). (5 pts each)

a.

1. ((R · S) ∨ (R · ~E))
2. ((O · Y) ⊃ (E · ~S))
3. ((O ⊃ ~Y) ⊃ L) / L

b.

1. (T ⊃ R)
2. (R ⊃ S)
3. (~R ≡ S) / (~T · S)

Proofs:

Use the full set of 18 rules **ONLY** (i.e. do **NOT** use conditional or indirect proof) to derive the conclusion of the following premises. (10 pts each)

c.

1. M ⊃ (R • E)
2. (E ∨ H) ⊃ G / M ⊃ G

d.

1. ~(O ⊃ R) ⊃ S
2. O ⊃ ~S / ~O v R

Proofs:

For the following argument do **two** proofs. For the first proof, use only the 18 rules to derive the conclusion of the following premises (i.e. do **not** use conditional or indirect proof). (15 pts) For the second proof, you must use the 18 rules **and** the conditional proof method (i.e. do not use the indirect method). (10 pts)

e.

1. (T ⊃ (H · J)
2. (H ∨ N) ⊃ T / T ≡ H