Problem Set 3
Due Friday, April 25.

Mathematical Logic

Math 114L, Spring Quarter 2008

1. (30 pt.) Parts (a) and (b) of Exercise 10 in Section 1.2 of the textbook. Then do:
   (c) Let α, β, γ be wffs. Determine all equivalent independent subsets of $\{\alpha \wedge \beta, \beta \wedge \gamma, \alpha \wedge \beta \wedge \gamma\}$.
2. (10 pt.) Exercise 2 in Section 1.3 of the textbook.
3. (20 pt.) A wff which does not contain $\neg$, $\rightarrow$, $\leftrightarrow$ is called *positive.* Show that for every positive wff α there exists a truth assignment satisfying α.
4. (20 pt.) Prove that $\{\wedge, \vee\}$ is not a complete set of connectives.
5. (20 pt.) Exercise 12 in Section 1.7 of the textbook. (Parts (a), (b), and (c) apply to subsets of size one, two, and three, respectively. The sequence could be extended: four, five, six, ... And the solution to any part is automatically a solution to all earlier parts. By the Compactness Theorem says there is no one solution that covers all the parts in this extended version.)