CSE 321: Discrete Structures Spring 2004

PROBLEM SET 2
Due Friday, April 16, 2004, in class

Instructions: Same as for Problem Set 1.

All exercise numbers refer to the number in Rosen's book, 5th Edition.

1. Section 1.3, Exercise 8
2. Section 1.3, Exercise 56
3. Section 1.4, Exercise 10, parts d,h,i,j.
4. Determine the truth value of $\exists x \forall y (x \leq y^2)$ when the universe of discourse is
   (a) Positive reals
   (b) Nonnegative reals
   (c) Positive integers
   (d) Nonnegative integers
5. Give the negation of each of the following statements (your final answer must be in the form of English sentences):
   (a) Every number is greater than some number.
   (b) No students of mathematics are unable to use a computer.
   (c) Everyone in the class with an Internet connection has emailed at least one other student in the class.
   (d) All good students study hard.
6. Prove or disprove the claim that $\forall x (P(x) \rightarrow Q(x))$ is logically equivalent to $\forall P(x) \rightarrow \forall Q(x)$.
7. Prove the resolution inference rule which states that $q \vee r$ follows from $p \vee q$ and $\neg p \vee r$, using only the equivalences and basic inference rules described in class and the logic handout.
8. Section 1.5, Exercise 12.
9. Section 1.5, Exercise 22.