

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.