

EECS 203-1
Homework 6
Due Feb. 12, 2002

Read Rosen Sections 3.1 starting page 175 up to but not including “The Halting Problem.” (Read this if you want to succeed in EECS 376!)

- Rosen page 182: 16a, 22, 26, 44b.
- Do problem 28 on page 183 by a generalization of the proof I did in class, involving prime factorizations. Show (as a lemma) that a positive number j is a perfect square if and only if each of its p -levels, for p a prime number, is even. (The prime numbers start at 2.) The p -level of a number j is the exponent of p in the prime factorization of j . Thus the 2-level of $98 = 2^1 \cdot 7^2$ is 1, and the 7-level is 2.

The next two problems refer to the universe of functions from \mathbb{R}^+ to \mathbb{R}^+ , where \mathbb{R}^+ is the set of positive real numbers.

- Prove that for any f and g , that if $f = O(g)$, then $g = \Omega(f)$.
- Prove that if $f = \Theta(g)$, then $g = \Theta(f)$.