Homework 8
Math 130 - Due March 24, 2011

Written Problems from P&B:

Section 5.3 (p. 121) # 1, 2, 3
Section 5.4 (p. 124) # 2, 3, 4, 6, 7, 8

To be done as a 40-minute quiz. Please show all your work, you will be graded on the presentation of your solutions as well as the mathematics involved.

1. Prove that a number N has an even number of factors if and only if it is NOT the square of a whole number.

   NOTE: There are two things to prove in this question! The first is "assume N has an even number of factors and show it is the square of a whole number". You should figure out the second part of the "if and only if" on your own and then prove it as well.

2. Consider the number 10! (this is read "ten factorial" - if you don't know what this is, find out).

   (a) Write down the prime factorization of 10! in exponential form. HINT: this can be found by writing down the definition and factoring the terms in the product, you don't have to multiply it out.

   (b) Find the largest number N such that 6^N divides 10!.