Math 475, Problem Set #9
(due 4/6/06)

A. Brualdi, chapter 7, problem 28, parts (b), (c), and (e).

B. Brualdi, chapter 7, problem 29, parts (b), (d), and (e). (Note for part (b) that 0 is a multiple of 3.)

C. Brualdi, chapter 7, problem 30, part (d).

D. Let f_n be the Fibonacci sequence as defined at the top of page 196. In this problem you will use the method of section 7.4 to solve the nonhomogeneous recurrence relation $h_n = h_{n-1} + f_n$ with the initial condition $h_0 = 0$.

   (a) Let $g(x) = \sum_{n=0}^{\infty} h_n x^n$, and show that $g(x) = \frac{x}{(1-x)(1-x-x^2)}$.

   (b) By doing a partial fraction expansion of $g(x)$ of the form $g(x) = A/(1-x) + (B+Cx)/(1-x-x^2)$, derive a formula for h_n in terms of Fibonacci numbers.

   (c) Check your answer by comparing with formula (7.8) in Brualdi.

E. Brualdi, chapter 7, problem 32.