MA 468-21 (Numerical Analysis), Dr. Chernov   Final test
Full credit is given for 5 (out of 6) problems   Due Thur, Nov 16 by 4:30 pm

1. Computer problem C-8.3.1 (page 589). The analytic solution can be found by separation of variables or by Maple or MatLab.

2. Computer problem C-8.2.2 (page 577).

3. Computer problem C-7.5.1(b) (page 552). Use $\varepsilon = 10^{-6}$ and $n = 1000$.

4. Run a computer program with the Romberg integration method (with $M = 8$) on the example

$$\int_0^1 \sin \sqrt{x} \, dx$$

Find the exact value of the integral (by substitution $x = t^2$ or by using Maple or MatLab) and compare it with the numerical solutions.

5. Problem 7.2.13 (page 525).

6. Use the (extended) divided difference method to obtain a polynomial of degree 5 that takes these values:

$$p(0) = 2, \ p(1) = 1, \ p'(1) = 2, \ p''(1) = 8, \ p(2) = 3, \ p(3) = -3$$