Instructions: Present your work in a neat and organized manner. Please use either the 8.5 × 11 size paper or the filler paper with pre-punched holes. Please do not use paper which has been torn from a spiral notebook. Please secure all your papers by using either a staple or a paper clip, but not by folding its (upper left) corner.

You must show all of the essential details of your work to get full credit. If I am forced to fill in gaps in your solution by using notrivial (at my discretion) steps, I will reduce your score for that particular assignment.

Please refer to the syllabus for the instructions on working on homework assignments with other students and on submitting your own work.

All problems in a given assignment contribute equal amount to the assignment’s total score, unless otherwise noted.

Homework Assignment # 6
Due Wednesday, October 15, 2008

1. (a) Sec. 5.9, # 4.
   (b) Sec. 5.9, # 6.
   (c) Sec. 5.9, # 7.
   (d) Sec. 5.9, # 8.

2. (a) Sec. 5.9, # 21.
   (b) Sec. 5.9, # 23.

3. This problem is worth 1.5 regular problems.
   (i) Sec. 5.9, # 10. In addition to the information stated in the problem regarding the rounding-off rule, you may also need to know that $\epsilon + \epsilon^2$ or $\epsilon^2 + \epsilon^3$ are evaluated correctly, but $1 + \epsilon + \epsilon^2$ is evaluated as $1 + \epsilon$, etc.
   (ii) Sec. 5.9, # 24.
   (iii) Sec. 5.9, # 25.

4. This problem is worth 0.5 (yes, a half) of a regular problem.
   (a) Sec. 5.9, # 19.
   (b) Without doing any calculations but referring to problems from earlier assignments, answer the following questions. (Make sure to quote the earlier problems whose results you used and explain your answers.)
   - Will you obtain a result similar to that in part (a) if you take “vectors” $\{e^{-4x}, e^{-5x}, e^{-6x}\}$ from the Laplace basis on $[0, 1]$?
   - Will you obtain a result similar to that in part (a) if you take “vectors” $\{e^{-4ix}, e^{-5ix}, e^{-6ix}\}$ from the Fourier basis on $[0, 2\pi]$? (The interval is changed to ensure periodicity of the basis functions.)