PHYS 308 – HOMEWORK # 6 – DUE WEDNESDAY, 3/30/2011

1. Compute the (real) Fourier coefficients for the function $f(x) = \cosh(x)$ in the interval $(-\pi, \pi)$. Write the Fourier expansion up to the first three non-zero terms.

2. Compute the (real) Fourier coefficients for the function

$$f(x) = \begin{cases} 0, & -1/2 < x < 0, \\ x, & 0 < x < 1/2, \end{cases}$$

   and write the Fourier expansion.

3. Expand the following function in Legendre series up to order three:

$$f(x) = \begin{cases} -1, & -1 < x < 0, \\ 1, & 0 < x < 1, \end{cases}$$

4. Expand the following function in Legendre series up to order three:

$$f(x) = \begin{cases} 0, & -1 < x < 0, \\ x, & 0 < x < 1, \end{cases}$$

Key

Unless otherwise specified, problems are from the course textbook:

F.W. Byron, R.W. Fuller
Mathematics of Classical and Quantum Physics
Dover Publications (1992)
ISBN-10: 048667164X, ISBN-13: 978-0486671642.

Problem X.Y p.Z means "Problem No. Y of Chapter X, page Z."

Example: Problem 1.3 p.39 = Problem No. 3 of Chapter 1, page 39.
