# PHYS 301 <br> HOMEWORK \#2 

Due : 26 Jan. 2015

On this assignment, show solution to all integrals explicitly, although you may use symmetry arguments (but if you do, make sure you explain how you obtain your result).
Find the Fourier coefficients for the following functions, then write out explicitly the first three non - zero terms of each Fourier series (your answer should use the format shown in the solution to problem 5.3 on p. 354).

1. $f(x)= \begin{cases}-1, & -\pi<x<\pi / 2 \\ 0, & \pi / 2<x<\pi\end{cases}$
2. $f(x)= \begin{cases}-x, & -\pi<x<0 \\ x, & 0<x<\pi\end{cases}$
3. $f(x)= \begin{cases}0, & -\pi<x<0 \\ x, & 0<x<\pi\end{cases}$
4. $f(x)= \begin{cases}0, & -\pi<x<0 \\ \sin (2 x), & 0<x<\pi\end{cases}$
5. We determined in class (as does your text) the Fourier series for
$f(x)= \begin{cases}0, & -\pi<x<0 \\ 1, & 0<x<\pi\end{cases}$
Plot the first ten non - zero terms of the Fourier series for this function using Mathematica. Print out your output and attach it to your homework assignment; make sure you show your code along with your plot.
