TUTORIAL-5

PROBLEMS BASED ON FOURIER SERIES (ODD AND EVEN FUNCTIONS AND HALF RANGE)

1. Find the Fourier series for f(x) =$|x|$ in $(-\pi,\pi)$.And hence find the sum of the series
$$\sum_{n=1}^{\infty}\frac{1}{(2n-1)^2}=\frac{\pi^2}{8}.$$

2. Find the half range sine series of $f(x)=lx-x^2\ in\ (0,l)$.

3. Obtain sine series for $f(x)=\begin{cases}x & ;0\le x\le\dfrac{l}{2}\\ l-x; & \dfrac{l}{2}\le x<l\end{cases}$

4. Obtain the Fourier cosine series for $f(x)=\begin{cases}kx & ;0\le x\le\dfrac{l}{2}\\ k(l-x); & \dfrac{l}{2}\le x<l\end{cases}$