

PHY102 : WAVES AND MATTER

ASSIGNMENT - 6

OPTIONAL. YOU DO NOT HAVE TO SUBMIT IT.
YOU ARE ENCOURAGED TO TRY OUT ALL THE PROBLEMS.

1. Find the Fourier series for,

$$\begin{aligned} f(x) &= A, & (0 \leq x \leq L) \\ &= 0, & (L \leq x \leq 2L) \end{aligned}$$

where A is a constant.

2. Find the Fourier series for,

$$\begin{aligned} f(x) &= x, & (0 \leq x \leq 1) \\ &= 1, & (1 \leq x \leq 2) \\ &= 3 - x, & (2 \leq x \leq 3) \end{aligned}$$

3. Find the Fourier series for $f(x) = \cos^2 x$.

NOTE : The solutions for the problems given above (as well as some more solved problems) are available at www.math24.net/fourier-series-functions-arbitrary-period.

4. Do the following problems from the book "The physics of vibrations and waves" (6th edition) by H. J. Pain. Problems 10.1, 10.2, 10.3, 10.5, 10.6, 10.7.