## TUTORIAL-4

## Problems based on Fourier series (Full range)

1. Find the Fourier series of $f(x) = (\pi - x)^2$ in $(0, 2\pi)$ of periodicity $2\pi$.

2. Find the Fourier series of $f(x) = \begin{cases} x & ; 0 < x < \pi \\ 2 - x & ; \pi < x < 2\pi \end{cases}$ Also deduce $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + \ldots\ldots\ldots\infty = \dfrac{\pi^2}{8}$.

3. Obtain the Fourier series of periodicity 3 for $f(x) = 2x - x^2$ in $0 < x < 3$.