# Math 4315/5315 - PDEs    Home Work 5

**Due: Fri. Nov. 20, 2020**

1. Calculate the Fourier series for the following

$$\text{(i) } f(x) = 1 - x^2 \text{ on } [-1,1]$$

$$\text{(ii)} f(x) = \begin{cases} x+2 & \text{if } -2 \le x \le 0 \\ 0 & \text{if } 0 < x \le 2 \end{cases}$$

For each sketch the curve on $[-L, L]$ and $[-3L, 3L]$.

2. Calculate the Fourier Sine and Cosine series for the following

$$\text{(i) } f(x) = 2x - x^2 \text{ on } [0,2]$$

$$\text{(ii)} f(x) = \begin{cases} x & \text{if } 0 \le x \le 2 \\ 4 - x & \text{if } 2 < x \le 4 \end{cases}$$

For each sketch the curve on $[-L, L]$ and $[-3L, 3L]$.