HW 5

Due Friday 03/09/2021

1. (24 points) Consider the function $f(x) = x^2$. Use MatLab to create the computer graphics to show the following:

   - Find the Fourier sine series, including the Fourier coefficients, for $f(x)$ for $x \in [0, 3]$.
   - Graph the original function and the Fourier sine series, where you use 3, 5, 10, 20, and 100 terms. Show the graph for $x \in [-6, 6]$.
   - Find the Fourier cosine series, including the Fourier coefficients, for $f(x)$ for $x \in [0, 3]$.
   - Graph the original function and the Fourier cosine series, where you use 3, 5, 10, and 20 terms. Show the graph for $x \in [-6, 6]$.
   - In all graphs include the original function for $x \in [-4, 4]$. (Don't extend to the full interval.)

Complete the following exercises from the textbook.

2. (10 points) Exercise 3.3.1c
3. (15 points) Exercise 3.3.14
4. (10 points) Exercise 3.4.6
5. (15 points) Exercise 3.4.11