MSCS 446 Numerical Analysis I
Written Assignment 11
Adhere to the Homework Guidelines
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1. (A) Burden & Faires page 534, #2c.

2. (N) Use collocation with monomial basis functions (Vandermonde matrix) and the data given in the Jupyter notebook for this assignment to interpolate $\hat{y}$ on $[-0.8, 2.05]$ with 47 interpolation values. You may assume (the given) evenly-spaced nodes.

3. (N) Expand $f(x)$ in a Fourier (cosine or sine) series. Example function is given in the Jupyter notebook for this assignment.

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

4. (N) Expand $f(x)$ in a Fourier (cosine or sine) series. Example function is given in the Jupyter notebook for this assignment.

$$f(x) = \begin{cases} x + 1 & \text{if} \quad -\pi < x < 0 \\ 1 - x & \text{if} \quad 0 < x < \pi \end{cases}$$

5. (N) Expand the data given in the Jupyter notebook for this assignment in a Fourier series.