

MAT 320 Homework 7

Fall 2023

Due date: Wednesday, Nov 22

You can use SciLab, or write a program to help in calculations, for any part of this homework.

1. Chapter 7, Problem 5, page 146-147. First do the problem for $\alpha = T/4$, then for the general case $0 < \alpha < T$. In both cases, write the Fourier series as a real series with no complex coefficients (as in equation 2.7 on page 130), and graph one period of the function $f(t)$. Additionally, plot the sum of the first nine terms in the Fourier series in the case when $T = 2$ and $\alpha = 1/2$ (similar to figure 3.2 on page 132).
2. For the graphs on page 132, figures 3.2 and 3.3, compute the first value of $t = t_0$ for which the Fourier series hits the value of 1. Then compute the t -values of the next two relative extrema in the graph, call them t_1 and t_2 . Finally, what is the difference $|F(t_2) - F(t_1)|$, where $F(t)$ is the Fourier series function ?