

# Math 135 Ordinary Differential Equations

Homework 5

April 30, 2022

## Fourier Series:

1. Section 33: Problem 1, 7
2. Section 34: Problem 5 Add this as part d: To what value does the series converge at the points of discontinuity?
3. Section 35: Problem 8 Do not use the Fourier series you derived to sketch the Fourier series.
4. Section 35: Problem 3
5. Suppose  $f$  is a piece-wise continuous function on  $[0, \pi]$  such that  $f(\theta) = f(\pi - \theta)$ . (That is, the graph of  $f$  is symmetric about the line  $\theta = \pi/2$ .) Let  $a_n$  and  $b_n$  be the Fourier cosine and sine coefficients of  $f$ . Show that  $a_n = 0$  for  $n$  odd and  $b_n = 0$  for  $n$  even.