

# MATH 603 - Final Assignment

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December 5th, 2024

# The Problems

1. Write a computer program to implement the Fast Fourier Transform (FFT).
2. Using the FFT, write a computer program to solve numerically the initial-value problem (IVP) for the heat equation,

$$\begin{cases} u_t = u_{xx} & (t, x) \in [0, \infty) \times [0, 1] \\ u(0, x) = f(x) & x \in [0, 1] \\ u(t, 0) = u(t, 1) = 0 & t \in [0, \infty) \end{cases}$$

# Outline

## Problem 1

Discrete Fourier Transform

Fast Fourier Transform

## Problem 2

Finite-Difference Method

Using the Fast Fourier Transform

# Sample

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Thank you!