

408L CLASS PROBLEMS

MAY 1ST, 2020

Problem 1. Find the Taylor series of $\cos(x^2)$ at 0.

Problem 2. Find the Taylor series of $\log(x)$ about 1. Find the Taylor series of an anti-derivative $\int \log(x)dx$ about 1. Use this to deduce an explicit formula for $\int \log(x)dx$. (Previously, we found this integral using integration by parts).

Problem 3. Find the third Taylor polynomial of $\sin(x) + \cos(x)$.

Problem 4. Estimate $\int_0^1 \frac{\sin(x)}{x} dx$ using the fifth degree Taylor polynomial of $\frac{\sin(x)}{x}$ about 0.