

Introduction to Analysis II
Instructor: Prof. Artem Zvavitch

Exam 3

(Must be in Artem's office/mail box/or just hands before the end of the class on Thursday, April 30. You may use any book and any notes, just try to do it yourself! Provide ALL details)

Problem 1. Calculate e correctly to 6 decimal places (no you can not use computer or tables).

Problem 2. Prove that if the partial sums of $\sum a_n$ are bounded then the series $\sum_{n=1}^{\infty} a_n e^{-nt}$ converges for all $t > 0$. Would it also necessary converge for $t = 0$?

Problem 3. Discuss the convergence and the uniform convergence of the series $\sum_{n=1}^{\infty} \sin(x/n^2)$.

Problem 4. Assume $\sum_{k=1}^{\infty} a_k x^k$ has the radius of convergence $R > 0$, please, find radius of convergence

- $\sum_{k=1}^{\infty} a_{2k} x^k$.
- $\sum_{k=1}^{\infty} a_k^2 x^k$.

Problem 5. Let $f(x) = \sum_{k=1}^{\infty} kx^k$, please, find $f(.75)$.