

Exam 4.

Problem 1. Find the limit $\lim_{n \rightarrow +\infty} a_n$, where $a_n = (1 + \frac{1}{2n} + \frac{1}{n^2})^{2n}$.

Problem 2. Determine either or not the infinite series converges
 $\sum_{n=1}^{\infty} \frac{1}{(\ln(n)+1)^2}$.

Problem 3. Find the radius of convergence for the power series
 $\sum_{n=1}^{\infty} \frac{n^2(x-4)^n}{n!}$.

Problem 4. Find the Maclaurin series for the function $\int_0^x \frac{\cos(2t)-1}{t} dt$.