

MATH 1953 Exam 4 Topics List/Study Guide

Here is a list of topics that can appear on Exam 4.

- 11.6: Know how to apply the Ratio and Root Tests to check whether a series is convergent or divergent. Remember that Ratio generally works better for expressions with factorials, and that Root generally is easier for expressions involving polynomials. Remember the useful facts that the n th root of any polynomial approaches 1 as $n \rightarrow \infty$, and the n th root of $n!$ approaches ∞ as $n \rightarrow \infty$.
- 11.7. Know how to decide which of the convergence tests from 11.2 - 11.6 to apply to check whether a series is convergent or divergent. The two 11.7 handouts from class (also posted on our website) are useful study aids here, but the best thing to do is just to practice setup for a ton of series problems (like the seven we did in class!)
- 11.8: Know how to find the interval of convergence of a power series. Remember that the steps are (i) use the Ratio/Root Test to find the radius of convergence/endpoints of the interval, and then (ii) to check the two endpoints by plugging them in and using some convergence test to decide whether the series converges or diverges at each endpoint. Remember that endpoints which are convergent are INCLUDED in the interval of convergence (i.e. they get a closed/square bracket [or] and that endpoints which are divergent are EXCLUDED (i.e. they get an open/parenthesis (or).) Know that the interval of convergence of a power series $\sum_{n=0}^{\infty} c_n(x - a)^n$ is always centered at the number a , meaning that the interval has endpoints $a - R$ and $a + R$ for R the radius of convergence. Remember that R can be any positive number, 0, or even ∞ !