

Math 1840 Midterm Exam #3 Review Sheet

Definitions to know

- Parametric equation, parameter
- Initial point, terminal point
- Polar coordinate system
- Sequence, Fibonacci sequence
- Sequence having a limit, convergent, divergent sequence
- Monotonic sequence, increasing, decreasing, bounded above, bounded below, bounded
- Infinite Series
- Convergent series, divergent series
- Geometric series, harmonic series, p-series, alternating series
- Conditionally convergent, absolutely convergent

Theory to know:

- Understand the epsilon-N definition for convergence of a sequence. Understand the definition of convergence of a series in terms of convergence of the sequence of partial sums.
- Limit Laws for sequences (p. 416)
- Squeeze Theorem for sequences
- Monotonic sequence theorem
- For which r does a geometric series converge and to what does it converge.
- Basic test for divergence (p.427 #7)
- Integral test for convergence (p.433)
- Comparison test (p. 435)
- Limit Comparison Test (p.436)
- Alternating Series Test (p.440) and error estimate (p.442)
- Difference between conditional and absolute convergence including examples of each.
- Ratio and root tests.

Skills to have:

- Understand how to parameterize simple curves.
- Find the tangent line to parameterized curves.
- Find the arc length of a parameterized curve.
- Go back and forth between polar and Cartesian coordinates.
- Sketch the graphs of simple polar curves in the x - y plane.
- Find equation of tangent lines to polar curves. Find points with vertical or horizontal tangent lines.
- Find the arc-length of a polar curve.
- Find the area enclosed by a polar curve $r=f(\theta)$.
- Give a formula for the n th term of a sequence, given the initial terms.
- Decide if a sequence converges or not.
- Evaluate the sum of a geometric series.
- Use the various tests to decide if a series diverges, converges conditionally or converges absolutely. (THIS IS ONLY ONE "SKILL" BUT IS PROBABLY 1/3 OF THE TEST).
- Given a series which converges by the A.S.T., determine how many terms one needs to get within a certain margin of the actual sum.