**Final Exam Review**

1. **Techniques of Integrations:** u-subs, trig subs, integration by parts (including tabular method), partial fractions decomposition, trig integrals.
2. **Improper Integrals** is improper if f(x) is discontinuous (undefined) at some point c on the interval [a, b], or one of the limits (a or b) is infinity.
3. **Volume by Disc or Shell Method**:
4. **Convergence of a Series**: Divergence test, geometric series, p-series, ratio test, root test, alternating series test, limit comparison test, direct comparison test, and integral test.
5. **Interval and Radius of Convergence**: Use ratio test and check the endpoints using tests for convergence.
6. **Parametric Curves**: Tangent line at a point, horizontal and vertical tangents, and arc length.
7. **Polar curves**: Graph a polar curve, tangent line, area inside a polar curve, and arc length.

**Problems**

1. Find the volume of the solid obtained by revolving the region bounded by
2. around the x-axis .
3. around the line y = - 1.
4. around the y-axis.
5. around the line x = 3.
6. Evaluate the following integrals.

1. Determine whether the following series converge or diverge.

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1. Determine the **radius** and **the interval of convergence** of the following power series.

1. Find the Taylor series for the following functions.

1. Find the equation of the tangent line to the curve at (1,1)
2. Determine where the curve has horizontal and vertical tangents.
3. Find the arc length of the curve
4. Find the equation of the tangent line to the curve
5. Find the area of the inner loop of
6. Find the arc length of a spiral