

Chapter 6 - Applications of the Integral

- Find the area between two curves.
- Find the volume of a solid of revolution using both disk/washer method and shell method.

Chapter 7 - Techniques of Integration

- Evaluate integrals using
 - integration by parts,
 - trigonometric identities,
 - trigonometric substitution, and
 - partial fractions
- Evaluate improper integrals.

Chapter 8 - Further Applications of the Integral

- Find the length of a curve.
- Find the surface area of a solid of revolution.

Chapter 10 - Infinite Series

- Find the limit of a sequence.
- Know when a geometric series converges and diverges.
- Know when a p -series converges and diverges.
- Determine if a series converges using
 - Test for Divergence,
 - Direct Comparison Test,
 - Limit Comparison Test,
 - Alternating Series Test,
 - Absolute Convergence,
 - Ratio Test,
 - Root Test, or
 - Integral Test.

- Determine if a series is absolutely convergent, conditionally convergent or divergent (using the aforementioned tests).
- Determine the radius and interval of convergence of a power series.
- Find the Taylor (Maclaurin) Series of functions using the definition.
- Find the Maclaurin Series of a function using known Maclaurin Series.

Chapter 11 - Parametric Equations, Polar Coordinates and Conic Sections

- Sketch a parametric curve; eliminate the parameter to write a set of parametric equations as a Cartesian equation.
- Find the tangent line to a parametric curve.
- Find the length of a parametric curve.
- Plot points in the polar coordinate system.
- Convert equations from Cartesian to polar and vice versa.
- Find the area of a polar region.
- Identify the different conic sections (ellipse, hyperbola, parabola) from their equations and find the pertinent features (vertices, foci, center, asymptotes, focal axis, conjugate axis, etc.)
- Determine the equation of a conic section given some information about it (such as its center and vertices).

Chapter 9 - Introduction to Differential Equations

- Solve separable differential equations (both with and without initial conditions).
- Solve first order linear differential equations (both with and without initial conditions).
- Interpret a word problem as a differential equation and solve: for example our logistic models or our mixing problems.