

## Chapter 6 - Applications of Integration

- 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,
  - partial fractions, and
  - rationalizing substitutions.
- Evaluate improper integrals.

## Chapter 8 - Further Applications of Integration

- Find the length of a curve.

## Chapter 9 - Differential Equations

- Solve separable differential equations (both with and without initial conditions).
- Use the natural growth model to solve problems involving population growth, radioactive decay, continuously compounded interest and Newton's Law of Heating/Cooling.

## Chapter 10 - Parametric Equations and Polar Coordinates

- 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.
- Find the area under a parametric curve.
- Plot points in the polar coordinate system.
- Convert equations from Cartesian to polar and vice versa.

- Find the slope of a tangent line to a polar curve.

## Chapter 11 - Infinite Sequences and 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 a power series representation for functions.
- Integrate and differentiate power series.
- Find the Taylor (Maclaurin) Series of functions using the definition.
- Find the Maclaurin Series of a function using known Maclaurin Series.