

## Advanced Placement Calculus A/B

### Part 1

#### Successful students will be able to:

- Interpret graphical and algebraic limits and recognize indeterminate forms
- Read limits and know how they represent important aspects of a graph including asymptotes and discontinuities
- Know the meaning of the derivative in terms of its definition, rate of change and local linear approximation
- Use derivatives to solve a variety of problems
- Recognize the method of differentiation of different function including power, product, quotient, exponential, implicit, and logarithmic rules
- Justify responses with Mean Value Theorem, Intermediate Value Theorem, and Extreme Value Theorems related to numerical data
- Find and classify critical points and inflection points from graphs, first and second derivative tests
- Communicate mathematics and explain solutions to problems both verbally and in written sentence

### Part 2

#### Successful students will be able to:

- Find specific antiderivatives by methods of u-substitution, integration by parts, and simple partial fractions
- Evaluate improper integrals
- Find specific antiderivatives using initial conditions including applications to motion along a line
- Use method of right endpoint, left endpoint, midpoint and trapezoidal Riemann sums definite integrals of functions represented algebraically, graphically, and by tables
- Understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change and should be able to use integrals to solve a variety of problems
- Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus
- Use technology to help solve problems, experiment, interpret results, and support conclusions
- Represent irregular geometric shapes by rotational and sub sectional volumes by means of integration
- Solve separable differential equations and use them in model exponential growth functions
- Interpret a graphs slope field in relation to its function antiderivative and be able to draw them
- Communicate mathematics and explain solutions to problems both verbally and in written sentence