

## AP Calculus AB - 1<sup>st</sup> Semester Topic List

### Chapter 1: Limits and Continuity

- \* Limits graphically, numerically, analytically
- \* Definition of continuity (3 conditions)

### Chapter 2: Differentiation

- \* Definition of derivative as slope of tangent line
- \* Power rule, product rule, quotient rule, chain rule, trig rule
- \* Implicit differentiation
- \* Related Rates

### Chapter 3: Applications of Differentiation

- \* Extrema on an interval
- \* Mean Value Theorem
- \* First Derivative Test (increasing, decreasing)
- \* Second Derivative Test (concave up, concave down)
- \* Curve Sketching
- \* Optimization word problems
- \* Tangent Line approximations

### Chapter 4: Integration

- \* Antiderivatives
- \* Area under a curve
- \* Riemann Sums and Definite Integrals (including Trapezoid rule)
- \* First Fundamental Theorem of Calculus
- \* Second Fundamental Theorem of Calculus
- \* Integration by Substitution

### Chapter 5: Natural Log function

- \* Differentiation
- \* Integration
- \* Inverse Functions