**AP Calculus BC Review Guide**

Assignment:
Create a 1-2 pages (front and back), handwritten, cumulative guide.

Scoring Rubric:
5 points: Your Name
20: Appearance (neatness, organized, legible)
75 points: Contains required content below

Unit Circle
-include radians, degrees, coordinate points

Limits & Continuity
-Definition of a Limit
-How to find a Horizontal and Vertical Asymptote
-Definition of Continuity
-L’Hospital’s Rule
-Intermediate Value Theorem (include example)

Derivatives
-Limit definition of a derivatives
-Derivative rules: constant, constant multiple, power, product, quotient, chain, trig, inverse trig, exponential (ex and 23x), natural log, implicit differentiation
-How to make a tangent line (include example)
-Mean Value Theorem (include example)

Applications of Derivatives: Characteristics of Functions
-Critical points
-Interval of increase, decrease
-Absolute/global vs. relative/local extrema
-Inflection points
-Interval of concave up, down
-Extreme Value Theorem
-First Derivative Test
-Second Derivative Test

More Applications of Derivatives
-Optimization
-Related Rates

Integrals
-Riemann Sums: rRam, lRam, mRam, trapezoid
-indefinite vs. definite integral
-Fundamental Theorem of Calculus (parts 1 & 2)
-Antiderivative rules: constant, power, trig, inverse trig, exponential (ex), natural log
- Average Value
-Arclength of a function

Motion
-Relationship between position, velocity, acceleration
-When a particle is at rest, moving in a positive/negative direction… in terms of velocity
-When a particle is speeding up or slowing down
-Distance vs. displacement integral

Area and Volume
-Area between a curve and the x-axis
-Area between 2 curves
-Rotational volume: disk vs. washer method
-Cross-sectional volume

Differential Equations
-Definition
-Steps to solve a diff eq
-Particular vs. general solutions to a diff eq
-Slope fields
-Euler’s Method

Continued on back 🡪

Techniques of Integration
-U-substitution (include example of indefinite and definite integral)
-Integration by parts
-Partial Fraction (include example)
-Long/Synthetic Division (include example)
-Improper Integrals: converging vs. diverging

Polar
-Definition
-Connecting Polar to Cartesian & Cartesian to Polar
-1st and 2nd derivative of a Polar curve
-Polar Area

Parametric
-Definition
-1st and 2nd derivative of a Parametric equation
-Parametric Arclength
-Speed
-Vectors

Sequences
-Definition
-Converging vs. Diverging sequences

Series
-Definition
-Converging vs. Diverging series
-Convergence tests: Test for Divergence, Geometric (include sum formula), p-series, comparison, limit comparison, alternating series, absolute vs. conditional convergence, ratio test, alternating series estimation theorem \*\*you can attach sheet we already made in class for these tests\*\*

Power Series
-Definition
-Radius & Interval of Convergence
-Power series and first four terms for functions: y=1/(1-x), e^x, sinx, cosx, arctan(x), ln(1+x)
\*\*all found on p.784 of textbook\*\*
-Taylor Series and first 4 terms
-MacLaurin Series and first 4 terms