Book # Reviewed: _____ **Reviewer #: _____**

_____: Point Total

How to grade:

You will assess the completeness and accuracy of each entry. If it appears to you that everything was accurately explained in full, give **4 pts** for that entry. If missing a minor point (for example: forgetting to do an example of volume rotating around y-axis even though explained it) then give **3 pts** for that entry – depending on how minor the missing point was. If missing multiple parts or a major part of the topic (ex. forgetting to discuss MRAM or not including the tabular method) then give **2 pts**. If just barely included – gave a formula but didn't explain anything or give any examples, give **1 pt**. If WRONG topic or not even included, then give **0 points**. **If went way above and beyond with explanation, you can give 5 pts**. YOU MUST EXPLAIN/LIST ANYTHING MISSING OR WRONG!! And comment if OUTSTANDING!!

_____ Derivative page (worth **4 pts**: (-1) for each missing **type** (if forgot all the inverse trigs = -2)) MEMORIZED derivatives (19) NOT rules (that is in a later section) but include constant, linear, and example of basic power (x^2)

_____ Integral page (worth **4 pts**: (-1) for each missing **type**) MEMORIZED Integrals (18) – NOT rules but include constant, linear, and example of basic power (x^2)

MISC SECTION:

_____ Average rate of change: slope formula **NOT derivative, EXAMPLES – one using f(x) and one finding "average velocity" given position equation.

_____ Continuity: limit definition, types of discont (removable, jump, infinite, oscillating – include graphs and equations), how to determine which type by limits, EXAMPLES (not just examples with graphs – show using function equations and limits)

___ ___ Euler's Method: when use – not separable, approximates values on solution curve, method to do (using tangent line equations) , EXAMPLE

_____ Horizontal and Vertical **asymptotes** using limits: how to find – infinite limits for horiz, limits as x approaches "a" from both sides equals infinities for vert. , EXAMPLES of each type

___ ___ L'Hospital's Rule (including **all** indeterminate forms): 0/0, ∞ / ∞ , $\infty - \infty$, $0(\infty)$, 1^{∞} , ∞^0, 0^0, EXAMPLES of each Type (so should be <u>at least</u> 4 examples total)

_____ Slope Fields: directions for how to draw, what they represent, what does the graph resemble?; EXAMPLE

DERIVATIVE SECTION:

_____ Concavity: 2nd derivative, points of inflection, what concavity looks like on f(x), what f ' (x) is doing, EXAMPLES (at least one should be algebraic and another should be graphical (given graph of f ', describe concavity of f)

_____ Critical numbers – definition, how to find, looking @ domain, etc; EXAMPLES (at least one analytic and one with graph)

_____ Derivative of general inverse functions: formula (find corresponding point, etc) EXAMPLE

_____ Differentiability: limit definitions of derivative, must be continuous, when not diff: cusps, corners, vert tangents, discontinuous; looking at domain of derivative to determine differentiability; differentiation rules – product, quotient, power, chain; EXAMPLES – of all different types **this is a big one**

_____ First Derivative Test: what it is and how to use, EXAMPLES (analytic AND graphing) – one should include case with a "double root", one should include determining extrema of f(x) when given graph of deriv

_____ Implicit Differentiation: include how to do y'' implicitly as well; EXAMPLES

_____ Increasing/Decreasing: derivative positive = increasing, neg = decr, EXAMPLES worked out

_____ Linearization – specifically using equation of tangent lines to approx values on solution, including how to determine if over- or underestimate: overest if concave down, under est if concave up, EXAMPLE

_____Mean Value Theorem for derivatives (Include Rolle's Thm as special case) : Hypotheses, formula with derivative: f(b) – f(a)/b-a = f ' (c) , EXAMPLES

_____ Motion (rect chart problems – include direction, speed incr/decr, etc): v(t)>0 right, v(t)<0 left; compare signs of v(t) and a(t) for speed incr/decr: same signs incr, diff signs decr,; parametric v(t), a(t), and speed ; EXAMPLES of both rect and parametric (parametric is NOT a chart) include applications (projectile)

_____ Optimization: max and min applications – steps to do, EXAMPLES (at least 2 different types)

_____ Related Rates: steps to do, using implicit differentiation, EXAMPLES (at least 2 different types)

_____ Second Derivative Test: NOT concavity!! Find crit #s and plug into f " : if >0 min, if <0 max, if = 0 use first deriv test, EXAMPLES

_____ Tangent Lines (include rect (3 types), parametric, and polar, also how to find horizontal and vertical tangents): need dy/dx and a point – use point slope form, horiz tangent where numerator = 0 (or dy/dt), vert tangents where denom = 0 (or dx/dt), how to find dy/dx for parametric and polar, EXAMPLES of each type **another big one**

INTEGRAL SECTION:

_____ Arclength (Rect and parametric form) basic formulas, special cases – corner and vert tangents (how to do), parametric formula: length = total distance traveled in parametric, EXAMPLES of each type – rect and par and special cases.

_____ Area of a region (including region bounded by polar curves): top – bottom (x's), rt – left (y's), split when change, polar formula, examples rect (x and y) and polar (one curve and intersecting), EXAMPLES of each type (at least 4 examples)

_____ Average Value of a function and MVT for Integrals: formula, MVT – set f(x) = avg value, EXAMPLES of each type

_____ Change of Variables to integrate (u-sub): How to do, include definite integrals and changing limits, at least 2 examples

_____ Differential Equations (separable): how to separate and do, examples should include 1 word problem (ie. rate of change pop proportional to pop), EXAMPLES (at least 2 – one "normal" where just separate and solve and one application)

_____ Fundamental Theorem of Calculus (2 parts): both parts – evaluating and derivatives of integrals, include how to find new Value (F(b)), should have example with function as one of the integral limits - chain, EXAMPLES of each type, include at least one example where given graph of deriv and finding new function value

_____ Improper Integrals: infinities as limits and discontinuous integrands – need both types, if integral = infinity then diverges, EXAMPLES of each type (at least 2)

_____ Integration by Parts: LIPET, tabular method , EXAMPLES (at least 2)

_____ Logistic : general differential equation, carrying capacity, infinite limit = carrying capacity, max population when at ½ carrying capacity, EXAMPLES of each type

_____ Partial Fractions: includes basic, repeated linear and irreducible quadratic, EXAMPLES of each type (at least 3)

_____ Riemann Sums and Rectangular Approximation (3) and Trap Rule: what are they used for, LRAM, RRAM, MRAM; when over/under est, EXAMPLES of each type – at least one given f(x) and another given table of values with different interval lengths

_____ Total Distance vs. Displacement: tot dist = integral of abs value of v(t), displacement = no abs value; for parametric, integral of speed: give formula, EXAMPLES of each type (rect and parametric)

_____ Volumes of rotations – washers and disks (include rotation about a line): formulas for both disks and washers, if line above or Right: radius = line – function, if line below or left: radius = function – line, EXAMPLES (at least 4)

_____ Volume of solid with known cross sections: perp to x = terms of x, perp to y = terms of y, find area formula and what length of rect represents in formula, volume = integral of area formula , EXAMPLES (at least 2)

SERIES SECTION:

_____ Alternating series: definition, convergence test, absolute v. conditional convergence, error, EXAMPLES of each type

_____ Comparison tests (both limit and direct): explain testing of both, how to find b_n, Ex of both (div and converging) for both

_____ Geometric Series: convergence and divergence, finding the ratio, how you know it's geometric – looks exponential, formulas for sum, EXAMPLES

_____ Integral test: hypotheses – must be positive termed, cont, and decreasing, do improper integral to check for convergence, if = # converges, if = infinities diverges, EXAMPLES(at least 2 – 1 conv,1 div)

_____ Lagrange error bound for Taylor polynomials: use when not alternating, Taylor's theorem (z's), still 1st omitted term but derivative is a function with z's – show less than a constant , EXAMPLES (at least 2 similar to ones in class)

_____ Maclaurin Series (include series reps for e^x, sin(x), cos(x), and 1/1-x) : explain how to find, centered at 0, manipulating known series (deriv, substitution, mult, etc) EXAMPLES

_____ Nth term test: only finds divergence! If limit not equal to zero, diverges. , EXAMPLES

_____ Power Series (recentering, find function to represent, derivatives of, integrals, manipulating (substitution), etc) discuss how deriv and integral keep same radius of conv but must check endpt for interval, EXAMPLES of each type (these should not start from Maclaurin series)

_____ P-series: general form, $p > 1$ converges, $p \leq 1$ diverges, EXAMPLES of each type

_____ Radius of convergence and intervals of convergence: Use ratio test unless geometric, must check endpoints, 3 possible intervals : 0, infinity, between 2 values, radius = dist from center to endpts of interval, EXAMPLES of each type

_____ Ratio test : infinite limit of n+1 term divided by n, if < 1 converges, >1 diverges, =1 inconclusive; use with factorials and nth powers, EXAMPLES of each type

_____ Taylor Polynomial degree n centered at c: how to do; if degree is n, then do n derivatives, include examples where you need to find the polynomial given f(x) and another where given poly and asked info about f(x) along with just writing Taylor poly

_____ Telescoping series: converges, use partial fractions and write out terms to find sum, EXAMPLE

_____ Neatness/following directions (take off points if used pencil and no sheet protectors, messy, not in order, hard to follow, no table contents, no section dividers, etc: **worth 10 pts) **If neatness, color, organization is the WOW factor, can give 12 pts****

_____ **Total points – Also write at top of front**