CALCULUS – MIDTERM EXAM REVIEW

1ST Semester Tests/Quizzes: Must be corrected (with corrections highlighted) and returned for points on the exam. Please put in order (I will provide list of assessments) and clip with a binder. Due on the day of the midterm.

Review Assignment:

Please complete indicated questions below from the textbook. Be sure to copy the problem (or enough of the problem to make your answer understandable WITHOUT the book.) Odd answers are at the back of the book and even answers are included. Indicated next to each section is the number of problems you can expect about that topic/section on the Midterm Exam.

I. Definitions/Meanings (1-2 Qs)
   A. Meaning of Derivative (physical & graphical)
   B. Formal Definition of Derivative at a Point
   C. Meaning of Integral
   D. Continuity at a Point

II. Limits & Continuity (≈7 Qs)
   A Graphically: p. 50 #5, #6, #8, #9; p. 51 #31
   B. Algebraically p. 51 #33, #37, #39; p. 68 T9\

III. Derivatives (≈15 Qs)
   p. 106 #13, #17, #21
   p. 135 #5, #13
   p. 139 #7, #9, #15
   p. 144 #2, #8, #19
   p. 152 #13, #15, #17
   p. 172 #2, #5, #15 (implicit differentiation)
   p. 286 #17;
   $y = (\ln 6x)(ln4x)$;
   $y = \tan(\ln x)$
   p. 293 #15, #19
   p. 294 #32, #36

IV. Integrals (≈10 Qs)
   p. 202 #8, #13, #17, #24
   p. 232 #8, #9, #11, #14
   p. 277 #27, #31, #37

V. Theorems (1-2 Qs) Write out theorem and do problems.
   A. Intermediate Value Theorem p. 61 #1
   B. Mean Value Theorem p. 217 #4
   C. Fundamental Theorem of Calculus p. 226 #3

VI. Trapezoid Rule & Riemann Sums (2 Qs) Review how to use programs as well as conceptual problems
   p. 27 R4 (c) & (d)
   p. 313 #12

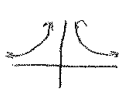
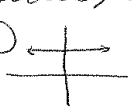
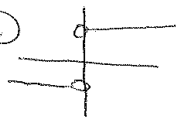
VII. Related Rates (1Q) Draw & label picture and show work thoroughly
p. 314 #27

VIII. Definite Integral Application: Area & Volume (2-3 Qs)
A. Area: p. 238 #5b, #23, #27
B. Volume p. 247 #2, #9 (no Reimann Sum check);
p. 314 #29

IX. Equation of tangent Line
Find the equation of the tangent line of $f(x) = 2x^2 + 5x + 1$ at the point $(-2, -1)$

EVEN ANSWERS:

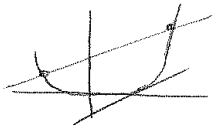
p. 50 #8
ⓐ Has left + right limits
ⓑ has no limit
ⓒ discontinuous; No limit

TQ p. 68 ⓐ  ⓑ  ⓒ  ⓓ 

p. 144
#2 $f'(x) = 3\sec(3x)\tan(3x)$
#8 $p'(x) = \frac{1}{\cos x \sin x}$ or $\sec x \csc x$

p. 172
#2 $y' = \frac{15x^4}{4y^3}$ $y = (\ln 6x)(\ln 4x)$ $y' = \frac{\ln 4x}{x} + \frac{\ln 6x}{x}$ $y = \tan(\ln x)$ $y' = \frac{\sec^2(\ln x)}{x}$

p. 294
#32 $c'(x) = 5x^4 \cdot 3^x + x^5 \cdot 3^x \cdot \ln 3$
#36 $y' = 10(\csc 5x)^{2x} \cdot \ln(\csc 5x)\csc 5x \cdot \cot 5x$

p. 202 #8 $= -\frac{20}{9}\cos(9x) + C$
p. 232 #8 30
p. 294 #48 $= \frac{1}{5}e^{5x} + C$
#54 $= e^{\sin x} + C$
p. 217 #4 $m = 5$ $g'(x) = 4x^3$ $c = \sqrt[5]{5/4} = 1.077\ldots$ 
p. 313 #12 $V_6 = 24.875\ un^2$
p. 314 #27 $\frac{dz}{dt} = -8.9443$ ft/sec Distance decreasing
p. 247 #2 $V = 261.7993\ un^3$
IX $y + 1 = -3(x + 2)$