Calculus Final Review

1. Graphs and Limits

a. Be able to calculate limits algebraically or estimate them from a graph or table of data.

b. Understand asymptotes in terms of limits of infinity.

c. Be able to apply L'Hopital's rule

2. Differential Calculus

a. Be able to find the derivative by finding the limit of the difference quotient

b. Understand the relationship between differentiability and continuity. (If a function is differentiable at a point, it's continuous there. But if a function is continuous at a point, it's not necessarily differentiable there.)

c. Be able to use the Power Rule, the Product Rule, the Quotient Rule and the Chain Rule.

d. Be able to find the slope of a curve at a point and the tangent and normal lines to a curve at a point.

e. Be able to find higher order derivatives.

f. Be able to use implicit differentiation.

g. Be able to determine whether a function is increasing or decreasing based on the sign if its derivative.

h. Know how to find the relative minimum and maximum of a function.

i. Be able to find the derivatives of trig functions, logarithmic functions, exponential functions and inverse trig functions.

3. Integral Calculus

a. Be able to find the area of a region, the volume of a solid revolution and the average value of a function.

b. Be able to solve acceleration, velocity and position problems.

c. Be able to integrate using the power rule and u-substitution.

d. Be able to find the definite integral of a function.

e. Use integration by parts to evaluate an integral

f. Be able to evaluate an improper integral by taking a limit

Calculus Final Review

Chapter 2

2.2: Find a limit graphically	Page 75: 11 – 23 odd
2.3: Find a limit analytically	Page 87: 5 – 31 odd, 45, 51, 53
2.5: Infinite limits	Page 108: 9 – 13 odd, 39 – 43 odd

Chapter 3

3.1: Limit of the difference quotient	Page 124: 13, 17
Equation of a tangent line	Page 124: 25, 27 (Use the derivative shortcuts)
3.2: Find derivatives	Page 136: 3 – 25 odd, 39 – 51 odd
3.3: Product, quotient rules	Page 147: 1, 5, 7, 11, 13, 15
3.4: Chain Rule	Page 161: 9 – 17 odd, 55 – 65 odd, 81, 83
3.5: Implicit differentiation	Page 171: 1, 3, 5

Chapter 4

4.3: Find increasing, decreasing intervals, max, min	Page 226: 17 – 25 odd
4.5: Limits at infinity	Page 245: 21 – 31 odd
4.6: Sketch a graph	Page 256: 9, 25
4.7: Optimization	Page 265: 9, 11, 19

Chapter 5

5.1: Indefinite integrals	Page 291: 15 – 29 odd
5.4: Definite integrals	Page 327: 5 – 19 odd
5.5: Integration by substitution	Page 340: 7 – 21 odd, 49

Chapter 6

6.2: Solve a differential equation	Page 400: 1, 3, 5, 41, 62
6.3: Separation of variables	Page 413: 1, 3, 7, 13
6.4: Logistic Equation	Page 422: 9, 11, 17

Chapter 7

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7.2: Washer method	Page 463: 1 – 3 all
7.3: Shell method	Page 472: 1, 3, 5

Chapter 8

8.2: Integration by Parts	Page 531: 5, 13, 27
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