BC Final Exam Review

**Unit 1 Geometry**

Shell Method for Volume based on surface area

r H

Arc Length from x = a to b

Surface Area for Revolution: revolved around y-axis

revolved around x-axis

**Unit 2 Indeterminate Forms/Improper Integrals**

Rewrite improper integrals as a limit

Indeterminate forms use L’Hopital

Indeterminate forms rewrite as division then use L’Hopital

Indeterminate forms , use logs to rewrite as multiplication, then division

**Unit 3 Differential Equations** Example:

Separate variables, integrate both sides, use initial condition to find C

Euler’s Method:

Exponential Growth: →

Newton’s Law of Cooling:

Logistic Growth Model: L is carrying capacity. Change in y is the greatest at ½ L

**Unit 4 Parametric Equations**

X and y are separate in terms of time

Slope of tangent line: 2nd derivative:

Arc Length:

Vector – Valued Functions

position

velocity speed = #

acceleration direction = unit vector

**Unit 5 Polar** point (r, Ѳ) function r = f(Ѳ)

x = r cos Ѳ

y = r sin Ѳ

Slope of tangent line:

Area enclosed by a polar region

Length of a polar equation =

**Unit 6 Series**

Tests for Convergence

P-series

Alternating Series

Ratio/Root Test

Telescoping Series

Integral Test

Nth term Test for Divergence

Geometric Series

Comparison Tests (Direct and Limit)

Geometric Series:

Taylor Series

