Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 102- Q1A Date: 13-7-2010

Problem 1: (5 points) Estimate the area under the graph of $f(x) = 4 - x^2$ from $x = -2$ to $x = 2$ using **four** approximating rectangles and taking the sample point to be the **left endpoint**.

Problem 2: (8 points)

(a) Evaluate the limit $\lim_{n\to\infty} \sum_{i=1}^{n} \left[\left(\frac{i}{n} \right)^2 + 2 \right] \left(\frac{4}{n} \right)$

(b) Write the limit as a definite integral on the interval $[0,1]$ and evaluate it.

Problem 3: **(8 points)** Evaluate the integrals

(a) $\int \frac{dx}{1+e^{-x}}$

(b) $\int \frac{x^3 + \ln x}{x}\, dx$

Problem 4: **(4 points)** If $f(x) = \int_{x^2}^{1} \frac{t \ln t}{t^2 + 1}\, dt$ find $f'(e)$.

Problem 1: (5 points) Estimate the area under the graph of $f(x) = 4 - x^2$ from $x = -2$ to $x = 2$ using **four** approximating rectangles and taking the sample point to be the **right endpoint**.

Problem 2: (8 points)

(c) Evaluate the limit $\lim_{n\to\infty} \sum_{i=1}^{n} \left[\left(\frac{i}{n} \right)^2 + 1 \right] \left(\frac{4}{n} \right)$

(d) Write the limit as a definite integral on the interval $[0,1]$ and evaluate it.

Problem 3: **(8 points)** Evaluate the integrals

(c) $\int \frac{dx}{e^x + e^{-x}}$

(d) $\int \frac{x + \ln x}{x \ln x}\, dx$

Problem 4: **(4 points)** If $f(x) = \int_{x^2}^{1} \frac{t \sin t}{t^2 + 1}\, dt$ find $f'(0)$.