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

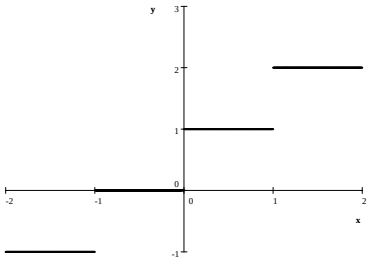
Instructor: M. Z. Abu-Sbeih Math 102- Q1 Date: 19-10-2009

<u>Problem 1:</u> (4 points) Estimate the area under the graph of $f(x) = 1 + x^2$ from $x = 0$ to $x = 4$ using **four** approximating rectangles and taking the sample point to be the **right endpoint**.

<u>Problem 2:</u> (4 points) Write the limit as a definite integral on $[0, 2\pi]$:

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{4\pi^2 i}{n^2} \tan\left(\pi + \frac{2\pi i}{n}\right)$$

<u>Problem 3:</u> (4 points) Use geometry to evaluate $\int_{-2}^{2} [\![x]\!]\, dx$



<u>Problem 4:</u> (4 points) If $f(x) = \int_{3}^{1-x^2} \frac{\cos t}{1+t^2}\, dt$ find $f'(1)$.

<u>Problem 5:</u> (3 points) If $f(5) = 10$, $f'(x)$ is continuous, and $\int_{2}^{5} f'(x)dx = 6$ find $f(2)$.

<u>Problem 5:</u> (6 points) Consider the are under the curve $f(x) = 1 - 2x + x^2$ from $x = 0$ to $x = 1$.

a. Write the area as a limit of the Riemann sum.

b. Write the area as a definite integral and **find it**.