232 Quiz 6

October 14, 2011

Section: _____ **Name:** _____

Suppose f is an integrable function on an interval $[a, b]$ that is divided into n subintervals with division points of the form $x_k = a + k\Delta x$.

1. Use the definition of the definite integral as a limit of Riemann sums to show the statement below. Justify each step/equality.

$$\lim_{n\to\infty} \frac{\sum_{k=1}^{n} f(x_k)}{n} = \frac{1}{b-a}\int_a^b f(x)\,dx$$

2. Considering the equation above:

a) Why is it algebraically sensible that the left hand side of the equation is a calculation of average value?

b) Why is it graphically sensible that the right hand side of the equation is a calculation of average value?