

MATH 1850 Sec 011 and 012

CALCULUS I

QUIZ 13

November 30, 2010

Name (Last, First) \_\_\_\_\_

1. Using rectangles whose height is given by the value of the function at the midpoint of the rectangle's base (*the midpoint rule*), estimate the area under the graph of the following function, using four rectangles.

$$f(x) = x^2 \text{ between } x = 0 \text{ and } x = 8.$$

We make 4 subintervals.  $[0, 2]$ ,  $[2, 4]$ ,  $[4, 6]$ ,  $[6, 8]$ . The sample points are  $c_1 = 1$ ,  $c_2 = 3$ ,  $c_3 = 5$ ,  $c_4 = 7$ .

Width of each rectangle  $\Delta x = 2$ .

$$\text{Therefore, area} = \sum_{k=1}^4 f(c_k) \cdot \Delta x = (f(c_1) + f(c_2) + f(c_3) + f(c_4)) \cdot 2 = (1 + 9 + 25 + 49) \cdot 2 = 168$$