

MATH 170 – Section 006 – Quiz 9

You may work with other class members on this quiz, but you may *not* receive assistance from people not in your MATH 170 section. You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or **YOU WILL GET A 'ZERO' ON THE QUIZ**. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by the beginning of class on Friday, 30 November 2007. **GOOD LUCK!**

1) Consider approximating the area under the curve $y = x^2$ (and above the x -axis) on the interval $I = [0, 1]$ using rectangles as we have done in class. Partition interval I using $P = \{0, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, 1\}$. For the sampling points x_i^* (which the book calls c_i) choose the midpoint of each subinterval defined by P . Draw a picture that clearly indicates the situation described above. Determine the approximation for the area under the curve using the choices described above.

2) Using the technique of Section 5.2 in the text and the material discussed in class, determine the exact area under the curve $y = x^3 + 2$ (and above the x -axis) on the interval $[1, 3]$.

3) Determine a formula for a function $f(x)$ and an interval $[a, b]$ such that

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \left(\frac{4}{n} + \frac{64i^2}{n^3} \right)$$

is the area under the graph of $y = f(x)$ (and above the x -axis) on the interval $[a, b]$. (In other words, tell me what a , b , and f are.)