

**Take Home Quiz 2: Riemann Sums**  
**Due Wednesday, December 8**  
**Math 251 Lecture 01**

You will have only one chance to complete this quiz. Good luck!

[5 pts]

1. Evaluate the sum

$$\sum_{i=0}^n i^2 + 2i + 1$$

in terms of  $n$ . (Hint: don't forget that your sum formulas apply to sums which begin at  $i = 1$ .)

[5 pts]

2. Express the limit below as a definite integral, but do not evaluate it.

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{\pi}{n} \sin\left(\frac{\pi i}{n}\right)$$

[5 pts]

3. Find the area bounded by  $x = 2$ ,  $x = 5$ ,  $y = 2x^2 + 2$  and the  $x$ -axis by computing an appropriate Riemann sum (you may NOT use the Fundamental Theorem of Calculus as a short cut).