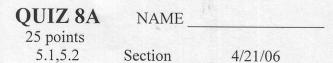
MATH 151	
Mrs. Bonny Tighe	



- 1. Find an expression for the area under the graph of  $f(x)=2\sin^3 3x + x\sqrt{x}$  on the interval [1,5] as a Riemann Sums using summation notation. Do not evaluate.
- 2. Determine a region whose area is equal to each of the following and express each as a definite integral, but do not evaluate.

a) 
$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{\pi}{8n} \sqrt{\frac{\pi^2 i^2}{64n^2} + \sin \frac{\pi i}{8n}}$$

b) 
$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{3}{n} \left( \sqrt{\frac{6i}{n}} + \frac{n}{3i} - \tan \frac{3i}{n} \right)$$

3. Estimate the area under the graph  $f(x) = x^2 + 2$  from x = 0 to x = 4 using n = 4, four approximating rectangles and the right endpoints, the left endpoints and then the midpoints. Graph f(x). Which estimation is an underestimate or an overestimate?

- 4. Given that  $\int_2^6 f(x)dx = 3/8$  and  $\int_2^8 f(x)dx = 1/8$ , what is  $\int_2^6 f(t)dt$ ?
- 5. Evaluate the integral by interpreting it in terms of areas, the graph and using elementary geometry.  $\int_{1}^{\infty} (4-x)dx$

6. Evaluate the definite integral  $\int_{i=1}^{n} (2+3x-x^2) dx$  using the definition (the limit of the summation)  $\sum_{i=1}^{n} c = cn$   $\sum_{i=1}^{n} i = \frac{n^2}{2} + \frac{n}{2}$   $\sum_{i=1}^{n} i^2 = \frac{2n^3}{6} + \frac{3n^2}{6} + \frac{n}{6}$