

**Homework 7**  
**Due Tuesday 5/3/2011 in discussion section**

**Name:**

**Section Number:**

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**This cover sheet must be attached as the top page of your homework.**

1. A ball is thrown directly upward from ground level with an initial velocity  $v(0) = 96 \text{ ft/s}$ . Assuming that the ball's only acceleration is that due to gravity (i.e.,  $a(t) = -32 \text{ ft/s}^2$ ), determine the maximum height reached by the ball and the time it takes to return to ground level.

2. Given the following integral:

$$\int_1^3 4x^2 + 2 \, dx$$

- (a) Estimate the value of the integral using a Riemann sum  $S_n = \sum_{k=1}^n f(a + k\Delta x)\Delta x$  with  $n = 4$  and using right endpoints.
- (b) Evaluate the definite integral **using the definition**. Use equal width subintervals and evaluate the function at right endpoints. So in this case, you are evaluating

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n f(a + k\Delta x) \Delta x,$$

where  $\Delta x = \frac{b-a}{n}$ .

3. Find the area of the region under the curve given by  $y = t\sqrt{t^2 + 9}$  on  $[0, 4]$ .
4. Find the average value of the function  $f(x) = \frac{x}{\sqrt{x^2+1}}$  on the interval  $[0, 3]$ .