Instructions: The following exercises are similar to those found in the course text book [related text book question are in brackets]. Show ALL your work and write neatly. This assignment is due at the beginning of the class period on the date above. Group work is allowed and encouraged, but each member must write up his/her own solutions. Submissions without staples, without a name, or without work shown *will not receive credit*.

1. [§4.7, # 42] A particle is moving according to the given acceleration function

$$a(t) = 12t^2 + 6t - 6.$$

   If $s(0) = 4$, and $s(1) = 2$, find the position function $s(t)$ of the particle.

2. [§5.1, # 4] Estimate the area under the graph of $f(x) = \sqrt{4 - x^2}$ from $x = 0$ to $x = 2$ using 4 approximating rectangles and
   a. right endpoints.
   b. left endpoints.
   In each case, sketch a graph of the function and the rectangles. Is your estimate an underestimate or an overestimate?

3. [§5.2, # 16] Express the following limit as a definite integral on the given integral. *[Just write the definite integral; do not solve.]*

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{\sin x_i}{x_i} \Delta x, \quad \left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$$

4. [§5.2, # 18] Express the following limit as a definite integral on the given integral. *[Just write the definite integral; do not solve.]*

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{x_i^*}{1 + (x_i^*)^2} \Delta x, \quad [-1, 1]$$

5. [§5.2, # 34] Evaluate the following integral by interpreting it in terms of areas.

$$\int_{-11}^{13} -\sqrt{144 - (x - 1)^2} \, dx.$$