LB 118, Section 003, Spring 2016
Homework 10 (due 04/27)

Instructions: Please review the section of the course syllabus on homework before writing up your solutions to the problems below. Do not write on or turn in this document. Instead, write your solutions on looseleaf or blank paper. Homework is due at the start of class.

1. Solve Exercise 9.1.4.

2. Solve Exercise 9.1.5.

3. (a) Evaluate the sum: $\sum_{i=1}^{4}(2-i)$.

   (b) Re-index the sum so that it starts with $k=0$: $\sum_{k=1}^{17} k^2$.

   (c) Compute the left-endpoint Riemann sum of $f(x)=\sqrt{x}$ using the partition $\Delta=\{1,4,9\}$ of the interval $[1,9]$. (Hint: Make a sketch. You are to compute the sum of the areas of two rectangles.) Is this an underestimate or an overestimate of the value of the integral $\int_1^9 \sqrt{x}\,dx$? Justify your answer by sketching the region whose area is represented by this integral and the rectangles corresponding to the Riemann sum.

4. Use a spreadsheet to compute the right endpoint Riemann sum of $f(x)=\frac{4}{1+x^2}$ on the interval $[0,1]$ using 100 rectangles of equal width. Your solution should include the following:

   - a description of the cells and the formulas that you used to compute the Riemann sum above.
   - the numerical answer
   - the exact value of the integral according to Wolfram Alpha

   Here are some hints:

   - The A1 cell should be labeled i. Enter `0` into the A2 cell. Then type the following into the A3 cell: `=A2+1`. Then copy the A3 cell and paste it into the cells A4–A101 in column A.
   - Create useful labels for additional columns, e.g. Δx.

- Utilize spreadsheet features like in the example above to automate the calculations. Please ask questions on Piazza if you need help.