Individual Homework #8: Due November 16, 2016

Please **READ** section 6.3, skipping the subsection "Error Bounds" on pp. 385–392; also **READ** sections 6.4 and 11.1.

Please **DO** exercises 1, 2, 5bd, 17, Section 6.3 (pp. 394–399); exercises 10, 11abcef, Section 6.4 (pp. 412–416); and exercises 10a–k, 11, 12, 14, 15, 24, 25, Section 11.1 (pp. 695–699).

Hints and Notes:

- For exercises 1 and 2, Section 6.3 (page 394), do NOT use the Fundamental Theorem of Calculus (which is not discussed until Section 6.4). Do these problems by remembering that a definite integral is a signed area, and use simple geometry to figure out the signed areas of the regions in question.
- (d) For exercises 5bd, Section 6.3 (page 395), estimate the integrals using Riemann sums, and the MATLAB program RIEMANN.m (as you did for a number of exercises in Section 6.2). That is: do not try to do these problems using the Fundamental Theorem of Calculus. Also, ignore the instructions about four decimal places accuracy. Instead, just do *right endpoint Riemann sums* with 5,000 rectangles.
- For exercise 17b, Section 6.3 (page 399), please do the requested graph using Matlab (and supply a copy of the graph with your HW).
- For exercise 10k, Section 11.1 (page 696), you'll need to recall that

$$\frac{d}{dx}[\arctan(x)] = \frac{1}{1+x^2}.$$

  (So: $\arctan(x)$ is an *antiderivative* of $1/(1+x^2)$.)
- Some of the exercises in Section 11.1 are of the form "Verify that $F(x)$ is an antiderivative of $f(x)$." This just means: "Show that $F'(x) = f(x)$." Example: to verify that $xe^x - e^x$ is an antiderivative of xe^x, we check:

$$\frac{d}{dx}[xe^x - e^x] = (x \cdot e^x + e^x \cdot 1) - e^x = xe^x + e^x - e^x = xe^x,$$

  as required.