In Section 5.3, read the bottom of page 371 and items 1–5 in the table on page 374.

In Section 5.4, read page 385.

Do the following problems:

p. 370 # 11, 12 Write each of these sums in Σ notation in **three different ways**; see Problem 7 on page 369 for a hint.

p. 380 # 10 (The instruction for this problem begins with "Suppose that f and h are integrable." You can **ignore** this phrase, here and everywhere else in this course).

Then do the following, using the definition of integral given at the end of this assignment.

A) Write

$$\lim_{n\to\infty} \sum_{i=1}^{n} \left(3 + i\frac{2}{n}\right)^2 \cdot \frac{2}{n}$$

as a definite integral $\int_a^b f(x)\,dx$ (that is, figure out what a, b and f are in this example).

B) Use the definition of integral to write

$$\int_1^4 (x^2 + x)\,dx$$

as a limit of Riemann sums.

In this course we will use the following definition for the integral:

$$\int_a^b f(x)\,dx = \lim_{n\to\infty} \sum_{i=1}^{n} f\big(a + i\frac{b-a}{n}\big) \cdot \frac{b-a}{n}$$

The sum

$$\sum_{i=1}^{n} f\big(a + i\frac{b-a}{n}\big) \cdot \frac{b-a}{n}$$

is called a *Riemann sum.* Thus **the integral is a limit of Riemann sums**.

The book gives a more complicated definition which is needed for work with discontinuous functions but will not be needed in this course.

You may have seen Riemann sums in your high school course. The Riemann sums we are using have *right-hand* endpoints and *equal* subintervals.