Chapter 5. Integration

5.1 Area and Estimating with Finite Sums

Note. In this section, we use finite sums to estimate quantities which we will calculate precisely using integrals.

Examples. Page 297 Example: estimate the area under $y = 1 - x^2$ and above the x-axis for $x \in [0, 1]$. Cut the region into 4 parts of equal width and then approximate the area using rectangles. For the height of each rectangle, use (1) the left hand endpoint, (2) the right hand endpoint, and (3) the midpoint of each little "subinterval." The actual area is 2/3. Notice Table 5.1 on page 300.

Example. Page 305 number 12.

Note. The exercises in this section are messy. However, the *ideas* introduced in this section are important, so **read this section!!!**