The Definite Integral (5.3)

Expected Skills.
At the end of this section, students will be able to:

- explain in words what the definite integral is, both in terms of Riemann sums and of area under a curve,
- give examples of functions that are integrable and functions that are not,
- compute definite integrals using known areas and rules satisfied by definite integrals,
- justify the rules satisfied by definite integrals using area arguments.

Pre-Class Activity (ch5-integrals-3-definite-1-pc)**.** In the pre-class activity, students explore how we can extend area estimates by using successive approximations. Students take successive left-hand and right-hand approximations and are challenged to reconcile these different approximations to compute the area of a quarter circle.

Worksheet (ch5-integrals-3-definite-2-ws)**.** In the class activity, students work with definite integrals. The goal here is for students to view definite integrals from a graphical perspective, understand that definite integrals represent constant values, and to explain the various algebraic properties of definite integrals. These goals are primarily explore through the context of the function $f(x) = \sqrt{9 - x^2}$, a semi-circle.