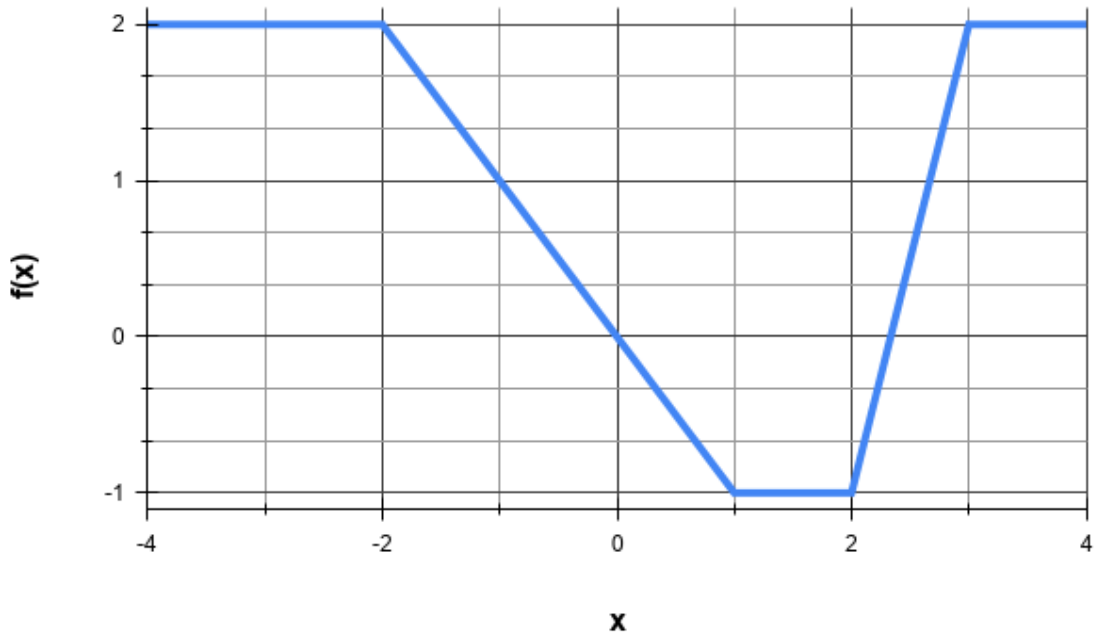


Chapter 5.2:
The Definite Integral
Calculus II
College of the Atlantic



1. A function $f(x)$ is shown above. Note the location of the vertical zero axis. Use the graph to determine values of the following:

(a) $\int_{-4}^{-2} f(x) dx$

(b) $\int_{-2}^0 f(x) dx$

(c) $\int_{-4}^0 f(x) dx$

(d) $\int_0^2 f(x) dx$

(e) $\int_2^3 f(x) dx$

2. What do the above results let you conclude about

$$\int_a^b f(x) dx + \int_b^c f(x) dx = ??? \quad (1)$$

3. Estimate $\int_2^4 x^2 dx$ using a Δt of 0.5.
4. Evaluate $\int_0^2 (2 + x) dx$ by graphing the function $f(x) = 2 + x$.
5. Let $r(t)$ be the rate, in people per minute, at which people arrive at the dining hall for dinner, where t is measured in minutes past 5:30. Consider the following integral:

$$\int_0^{30} r(t) dt . \tag{2}$$

- (a) What are the units of the above integral?
 - (b) What is the practical interpretation of the above integral?
 - (c) What are the units of $\frac{dr}{dt}$?
 - (d) What is the practical interpretation of $\frac{dr}{dt}$?
6. Determine the average value of $f(x) = x^2$ on the interval from -1 to 1 .
 7. Determine the average value of $f(x) = x^3$ on the interval from -1 to 1 .