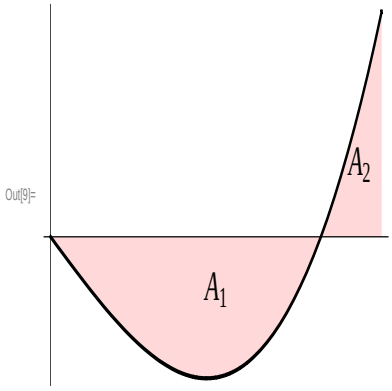


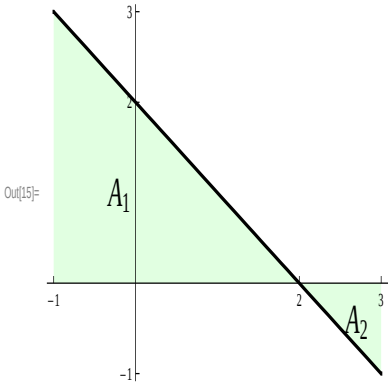
When we take the limit of such Riemann Sums, we get

$$\int_a^b f(x)\,dx = A_2 - A_1$$

where A_2 is the area of the region above the x-axis and below the graph of f and A_1 is the area of the region below the x-axis and above the graph of f.

Side Note If we are interested in the *total area* we need to calculate $\int_{-1}^{3} |2-x|\,dx$

Example Evaluate the integral by interpreting each in terms of area $\int_{-1}^{3}(2-x)\,dx$



Above we have the graph of the area we are calculating. By discussion preceding this example we know

$$\int_{-1}^{3}(2-x)\,dx = A_1 - A_2 = \frac{3\cdot 3}{2} - \frac{1\cdot 1}{2} = \frac{8}{2} = 4$$