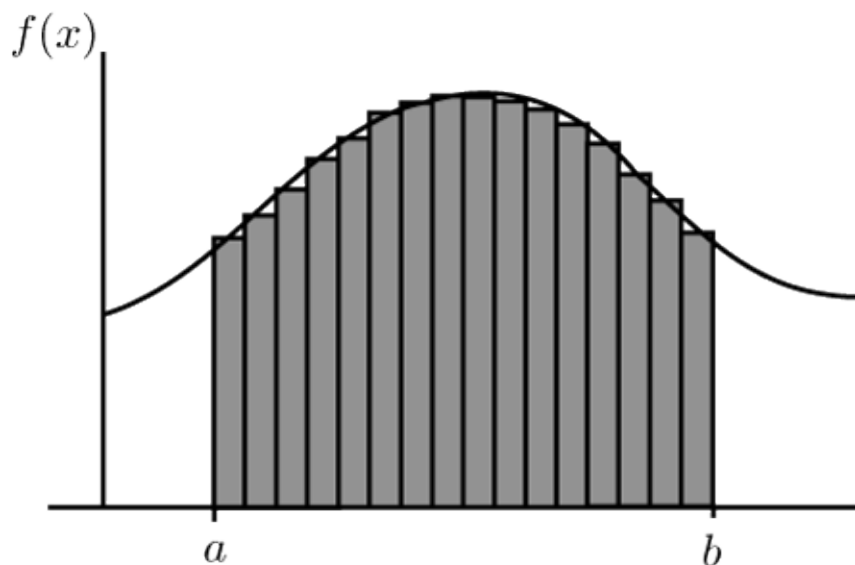


# Reviewing Area Between Curves (HW #1)

$\int_a^b f(x) dx \approx$  the sum of small quantities that are indexed by values on a real number axis:



Label a number  $x_i$  corresponding to the  $i$ th small quantity  $f(x_i)\Delta x$ . Now write the definition of  $\int_a^b f(x) dx$ .

All applications of the definite integral must have small quantities indexed by a real number axis of your choosing.

Find the area between  $y = x^2$  and  $y = x^3$  if  $-1 \leq x \leq 2$ . Use the x-axis to index slices.

Find the area bounded by  $y = \ln(x)$ ,  $y = 0$ , and  $x = 2$ . Using the y-axis to index slices is easier than using the x-axis unless you remember integration by parts.

Find the area in the first quadrant between  $x^2 + y^2 = 1$  and  $\sqrt{x} + \sqrt{y} = 1$ . Hint for the second curve: solve for  $y$  and differentiate twice to show the curve is concave up.