1 | **Slicing into Rectangles**

The general idea of Riemann sums is to slice a curve into vertical non-overlapping rectangles to approximate the area between the curve and the x-axis. This can be expressed mathematically as a summation given the function $f(x)$, the range $[a, b]$, and the number of rectangles n:

$$\sum_{k=1}^{n} \frac{b-a}{n} f(a + k\frac{b-a}{n})$$

This can be written more concisely by defining $\Delta x = \frac{b-a}{n}$ and $x_i = a + k\Delta x$:

$$\sum_{k=1}^{n} \Delta x f(x_i)$$

2 | **Area Interpretation**

3 | **Upper and Lower Bound**

4 | **the Definite Integral**