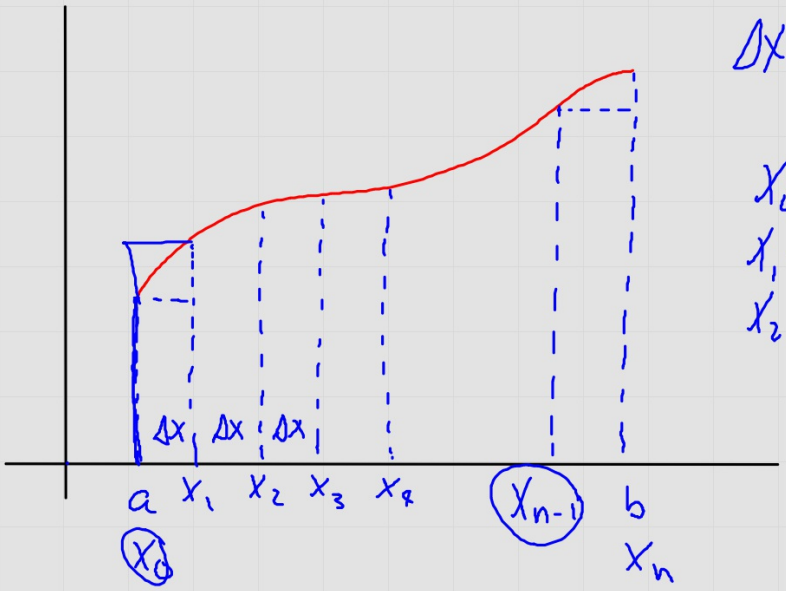
Approximating Area via Riemann Sums



$$\Delta x = \frac{b-a}{n}$$

$x_0 = a$

$x_1 = a + \Delta x$

$x_2 = a + 2\Delta x$

$\vdots$

$x_{n-1} = a + (i-1)\Delta x$

$x_n = a + i\Delta x$

$$A_L \approx \sum_{i=0}^{n-1} f(x_i)\Delta x \qquad A_R \approx \sum_{i=1}^{n} f(x_i)\Delta x$$

$f(x) = x^2 + 5x + 6$, $x=1$, $x=6$, 4 subs, L.S.

$$\Delta x = \frac{5}{4}$$

$x_0 = 1$

$x_1 = 2.250$

$x_2 = 3.500$

$x_3 = 4.750$

$x_4 = 6$

$$A_L \approx \sum_{i=0}^{3} f(x_i)\,\Delta x$$

$$\approx \left(\frac{5}{4}\right)(122.375)$$

$$\approx 152.969$$

$$A_R \approx \sum_{i=1}^{4} f(x_i)\,\Delta x$$

$$\approx \left(\frac{5}{4}\right)(182.375)$$

$$\approx 227.969$$

STEPS

y1 = f(x)

cal. Δx

seq(x, x, a, b, Δx)

Edit list → a

sum(y1(a1))

* Δx

$f(x) = x^2 + 5x + 6$, $x = 1$ to $x = 5$, 5 sub, M.S.

$$\Delta x = \frac{4}{5} = .800$$

$x_0 = 1 \longrightarrow m_1 = 1.400$

$x_1 = 1.800 \longrightarrow m_2 = 2.200$

$x_2 = 2.600 \longrightarrow m_3 = 3$

$x_3 = 3.400 \longrightarrow m_4 = 3.800$

$x_4 = 4.200 \longrightarrow m_5 = 4.600$

$x_5 = 5$

$$A_M \approx \sum_{i=1}^{5} f(m_i)\Delta x$$

$$\approx (.8)(156.900)$$

$$\approx 125.120$$