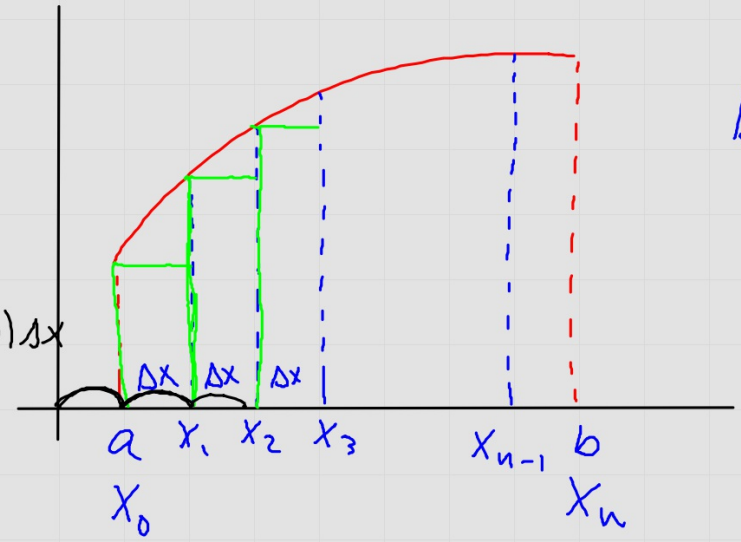
Approximating Area via Riemann Sums



$x_0 = a$

$x_1 = a + \Delta x$

$x_2 = a + 2\Delta x$

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

$x_i = a + i\Delta x$

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

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

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

$\Delta x = \frac{5}{4} = 1.250$

$x_0 = 1$

$x_1 = 2.250$

$x_2 = 3.500$

$x_3 = 4.750$

$x_4 = 6$

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

$$\approx (1.250)(122.375)$$

$$\approx 152.969$$

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

$$\approx (1.250)(182.375)$$

$$\approx 227.969$$

STEPS

y1 = f(x)

calc ΔX

seq(X, X, a, b, ΔX) ← seq(X, X, a + ΔX/2, b, ΔX) → a

Edit list → a

sum(y1(a))

* ΔX

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

$\Delta x = .800$

$$A_M \approx \sum f(m_i)\Delta x$$

$$\approx (.8)(156.400)$$

$$\approx 125.120$$

$x_0 = 1 \longrightarrow m_1 = 1.400$

$x_1 = 1.800 \longrightarrow m_2 = 2.200$

$x_2 = 2.600 \longrightarrow m_3 = 3$

$x_3 = 3.400 \longrightarrow m_4 = 3.800$

$x_4 = 4.200 \longrightarrow m_5 = 4.600$

$x_5 = 5$