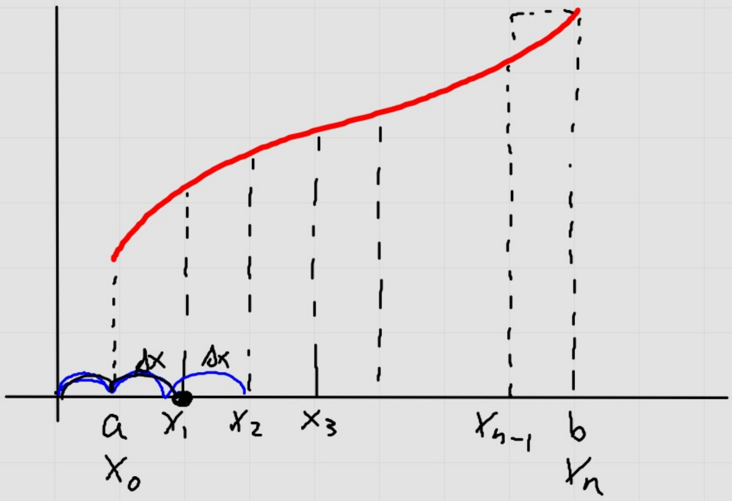
Approximating Area via Riemann Sums



partitioning the interval into subintervals of equal width

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

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

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

$X_0 = a$

$X_1 = a + \Delta X$

$X_2 = a + 2\Delta X$

$X_{n-1} = a + (i-1)\Delta X$

$X_n = a + i\Delta X$

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

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

$x_0 = 1$

$x_1 = \frac{9}{4}$

$x_2 = \frac{7}{2}$

$x_3 = \frac{19}{4}$

$x_4 = 6$

$$A_L \approx \frac{5}{4} \sum_{i=0}^{3} f(x_i)$$

$$\approx \left(\frac{5}{4}\right)\left[12 + \frac{357}{16} + \frac{143}{4} + \frac{837}{16}\right]$$

$$\approx \frac{5}{4} \cdot \frac{979}{8}$$

$$\approx \frac{4895}{32}.$$

Put f(x) in y1

Find Δx

seq$(x, x, a, b, \Delta x)$ seq$(x, x, a + \frac{\Delta x}{2}, b, \Delta x)$

For midpoints

Edit list $\rightarrow$ a

sum(y1(a))

$* \Delta x$

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

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

$x_0 = 1$

$x_1 = 2.250$

$x_2 = 3.500$

$x_3 = 4.750$

$x_4 = 6$

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

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

$$\approx 227.969$$

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

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

$x_0 = 1$

$x_1 = 1.800 \longrightarrow m_1 = 1.400$

$x_2 = 2.600 \longrightarrow m_2 = 2.200$

$x_3 = 3.400 \longrightarrow m_3 = 3$

$x_4 = 4.200 \longrightarrow m_4 = 3.800$

$x_5 = 5 \longrightarrow m_5 = 4.600$

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

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

$$\approx 125.120$$