

As we have seen, high-degree (large n) interp.
is in general not recommended
→ piecewise

Divide the integration interval $I = [a, b]$
in N subintervals

$$I_j = [x_{j-1}, x_j], \quad j = 1, 2, \dots, N$$

$$x_j = a + \underbrace{\frac{b-a}{N}}_h \cdot j, \quad j = 0, 1, \dots, N$$

and apply a QR over each I_j .

This leads to so-called composite QR (CQR)

Ex.: (10) composite TR

$$Q_0^N[f] = h \cdot \sum_{k=1}^N f\left(\frac{x_{k-1} + x_k}{2}\right)$$

(11) composite TR

$$Q_1^N[f] = h \cdot \left(\frac{1}{2} f(a) + \sum_{k=1}^{N-1} f(x_k) + \frac{1}{2} f(b) \right)$$

(12) composite SR

$$Q_2^N[f] = \frac{h}{6} \left(f(a) + 2 \cdot \sum_{k=1}^{N-1} f(x_k) + 4 \cdot \sum_{k=1}^N f\left(\frac{x_{k-1} + x_k}{2}\right) + f(b) \right)$$