Formule di quadratura di Newton-Cotes composite.
Posto $M \geq 1$:

$$H = \frac{b-a}{M}, \quad a_i = a + iH,\ i = 0, ..., M,\ a = a_0,\ b = a_M.$$

($M = 1 \Rightarrow$ Formule di quadratura semplici).

• Formula del punto medio composita

$$\boxed{\tilde{I}_{PM}^{(c)}} = \boxed{H \sum_{i=1}^{M} f\left(a_i - \frac{H}{2}\right)}$$

Errore:

$$I(f) - \tilde{I}_{PM}^{(c)} = \quad \tfrac{b-a}{24} H^2 f^{(2)}(\eta),\ \eta \in (a,b) \quad \text{(formula classica)}$$

$$I(f) - \tilde{I}_{PM}^{(c)} = \quad \tfrac{H^2}{24}[f^{(1)}(b) - f^{(1)}(a)] \qquad \text{(formula asintotica).}$$

• Formula dei trapezi composita

$$\boxed{\tilde{I}_{T}^{(c)}} = \frac{H}{2} \sum_{i=1}^{M} [f(a_{i-1}) + f(a_i)] = \boxed{\frac{H}{2}\left[f(a) + f(b) + 2\sum_{i=1}^{M-1} f(a_i)\right]}$$

Errore:

$$I(f) - \tilde{I}_{T}^{(c)} = \quad -\tfrac{b-a}{12} H^2 f^{(2)}(\eta),\ \eta \in (a,b) \quad \text{(formula classica)}$$

$$I(f) - \tilde{I}_{T}^{(c)} = \quad \tfrac{H^2}{12}[f^{(1)}(a) - f^{(1)}(b)] \qquad \text{(formula asintotica).}$$

• Formula di C. Simpson composita

$$\boxed{\tilde{I}_{CS}^{(c)}} = \frac{H}{6} \sum_{i=1}^{M} \left[f(a_{i-1}) + 4f\left(a_i - \frac{H}{2}\right) + f(a_i)\right] =$$

$$\boxed{\frac{H}{6}\left[f(a) + f(b) + 2\sum_{i=1}^{M-1} f(a_i) + 4\sum_{i=1}^{M} f\left(a_i - \frac{H}{2}\right)\right]}$$

Errore:

$$I(f) - \tilde{I}_{CS}^{(c)} = \quad -\tfrac{b-a}{2880} H^4 f^{(4)}(\eta),\ \eta \in (a,b) \quad \text{(formula classica)}$$

$$I(f) - \tilde{I}_{CS}^{(c)} = \quad \tfrac{H^4}{2880}[f^{(3)}(a) - f^{(3)}(b)] \qquad \text{(formula asintotica).}$$