Damit

$$Q_0[f] = (b-a)\cdot f\left(\frac{a+b}{2}\right)$$

(4) Trapezregel (TR) $(n=1)$

Knoten: $x_0 = a$, $x_1 = b$

LP : $L_0^1(x) = \dfrac{x-b}{a-b}$

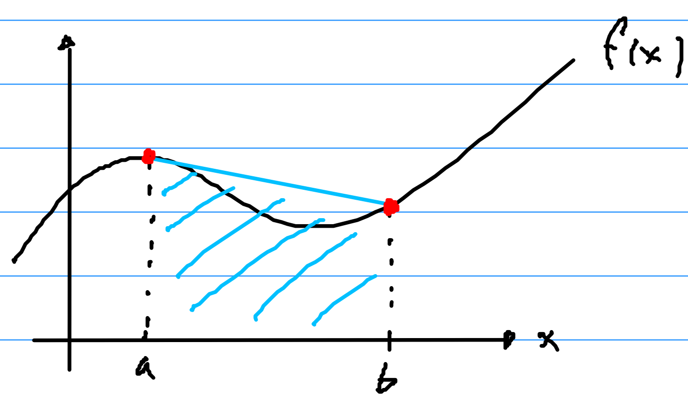
$$L_1^1(x) = \frac{x-a}{b-a}$$

Gewichte: $w_0 = \int_a^b L_j^0(x)\,dx = \int_a^b \frac{x-b}{a-b}\,dx$

$$= \frac{b-a}{2}$$

$\left[= \dfrac{(x-b)^2}{2(a-b)} \Big|_a^b = \right]$

$$w_1 = \ldots = \frac{b-a}{2}$$



Damit

$$Q_1[f] = \frac{b-a}{2}\left(f(a) + f(b)\right)$$