

Bsp.: (13) 2-Punkte GLQ ($n=1$)

(1) Berechne $P_{n+1}(x) = P_2(x)$ mit Rekursionsformel

$$P_2(x) = \frac{3}{2}x^2 - \frac{1}{2} = \frac{1}{2}(3x^2 - 1)$$

(2) Berechne Nullstellen von $P_2(x)$

$$\frac{1}{2}(3x^2 - 1) \stackrel{!}{=} 0$$

$$x_{0,1} = \pm \frac{1}{\sqrt{3}}$$

(3) Berechne Gewichte

$$\begin{aligned} \omega_0 &= \frac{2(1 - x_0^2)}{(2 \cdot P_1(x_0))^2} = \frac{2(1 - 1/3)}{(2 \cdot (-1/\sqrt{3}))^2} \\ &= \frac{\cancel{2} \cdot \overbrace{(1 - 1/3)}^{2/3}}{\cancel{2} \cdot \frac{1}{3}} = 1 \end{aligned}$$

$$\omega_1 = 1$$

$$\text{Also } G_1[f] = f\left(-\frac{1}{\sqrt{3}}\right) + f\left(\frac{1}{\sqrt{3}}\right)$$