

$$\begin{array}{c}
 x_0 + \theta_2 h \quad x_0 + \theta_3 h \quad I = \int_a^b f(x) dx \\
 \text{---} \bullet \text{---} \bullet \text{---} \bullet \text{---} \bullet \text{---} \\
 a \qquad \qquad \qquad b \\
 x_0 + \theta_0 h \qquad \qquad x_0 + \theta_1 h
 \end{array}$$

$$\#5, \text{ § 4.2} \quad I = \int_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} f(x) dx \approx \sum_{i=2}^3 a_i f(x_0 + \theta_i h)$$

$$\begin{aligned}
 \int_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} p_0(x) dx &= \int_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} 1 \cdot dx = x \Big|_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} = (\theta_1 - \theta_0) h \\
 \int_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} p_1(x) dx &= \int_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} (x - x_0) dx = \frac{1}{2} (x - x_0)^2 \Big|_{x_0 + \theta_0 h}^{x_0 + \theta_1 h} \\
 &= \frac{1}{2} (\theta_1^2 - \theta_0^2) h^2 = \frac{1}{2} (\theta_1 - \theta_0) (\theta_0 + \theta_1) h^2
 \end{aligned}$$

$$(\theta_1 - \theta_0) h = a_2 + a_3$$

$$\frac{1}{2} (\theta_1^2 - \theta_0^2) h^2 = \theta_2 h a_2 + \theta_3 h a_3$$