1

$$S_1(x) = \frac{a_1}{3}(1-x)^3 + \frac{a_2}{3}\left(x-\tfrac{1}{2}\right)^3 + \left(2f_1 - \frac{a_1}{12}\right)(1-x) + \cdots$$

$$\cdots + \left(2f_2 - \frac{a_2}{12}\right)\left(x-\tfrac{1}{2}\right)$$

$$a_0 + 4a_1 + a_2 = 4 \cdot 6\left(0 - 2\cdot\tfrac{1}{2} + 0\right)$$

$$= 24 \cdot (-1)$$

$$= -24$$

$$a_0 = -24 - 4a_1 - a_2$$

$$a_1 = \frac{1}{4}(-24 - a_0 - a_2)$$

$$a_2 = -24 - 4a_1 - a_0$$

$(x_i) = S(x_i)$