ORIGIN := 1

$a_2(x) := 2 + 3x$ $h := 12$ $n := 6$ $d_0 := 4$ $b_0 := 1$ $\alpha := 1$

$b_1(x) := \cos(x) - 1$ $b_2(x) := \sin(x)$

$b_3(x) := \cos(2 \cdot x) - 1$ $b_4(x) := \sin(2 \cdot x)$

$b_5(x) := \cos(3 \cdot x) - 1$ $b_6(x) := \sin(3 \cdot x)$

$$K_{11} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_1(x)\right) dx \quad K_{22} := \int_0^1 \left(\frac{d}{dx} b_2(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_2(x)\right) dx \quad K_{33} := \int_0^1 \left(\frac{d}{dx} b_3(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_3(x)\right) dx \quad K_{44} := \int_0^1 \left(\frac{d}{dx} b_4(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_4(x)\right) dx$$

$$K_{12} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_2(x)\right) dx \quad K_{23} := \int_0^1 \left(\frac{d}{dx} b_2(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_3(x)\right) dx \quad K_{34} := \int_0^1 \left(\frac{d}{dx} b_3(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_4(x)\right) dx \quad K_{45} := \int_0^1 \left(\frac{d}{dx} b_4(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_5(x)\right) dx$$

$$K_{13} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_3(x)\right) dx \quad K_{24} := \int_0^1 \left(\frac{d}{dx} b_2(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_4(x)\right) dx \quad K_{35} := \int_0^1 \left(\frac{d}{dx} b_3(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_5(x)\right) dx \quad K_{46} := \int_0^1 \left(\frac{d}{dx} b_4(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx$$

$$K_{14} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_4(x)\right) dx \quad K_{25} := \int_0^1 \left(\frac{d}{dx} b_2(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_5(x)\right) dx \quad K_{36} := \int_0^1 \left(\frac{d}{dx} b_3(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx \quad K_{55} := \int_0^1 \left(\frac{d}{dx} b_5(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_5(x)\right) dx$$

$$K_{15} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_5(x)\right) dx \quad K_{26} := \int_0^1 \left(\frac{d}{dx} b_2(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx \quad K_{56} := \int_0^1 \left(\frac{d}{dx} b_5(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx \quad K_{66} := \int_0^1 \left(\frac{d}{dx} b_6(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx$$

$$K_{16} := \int_0^1 \left(\frac{d}{dx} b_1(x)\right) \cdot a_2(x) \cdot \left(\frac{d}{dx} b_6(x)\right) dx$$

$$K_{FF} := \begin{pmatrix} K_{11} & K_{12} & K_{13} & K_{14} & K_{15} & K_{16} \\ K_{12} & K_{22} & K_{23} & K_{24} & K_{25} & K_{26} \\ K_{13} & K_{23} & K_{33} & K_{34} & K_{35} & K_{36} \\ K_{14} & K_{24} & K_{34} & K_{44} & K_{45} & K_{46} \\ K_{15} & K_{25} & K_{35} & K_{45} & K_{55} & K_{56} \\ K_{16} & K_{26} & K_{36} & K_{46} & K_{56} & K_{66} \end{pmatrix}$$

$$K_{FF} = \begin{pmatrix} 1.144 & -1.361 & 3.256 & -0.541 & 3.701 & 2.321 \\ -1.361 & 2.356 & -4.187 & 2.4 & -5.846 & -0.067 \\ 3.256 & -4.187 & 9.512 & -2.35 & 11.619 & 5.465 \\ -0.541 & 2.4 & -2.35 & 4.488 & -5.473 & 5.35 \\ 3.701 & -5.846 & 11.619 & -5.473 & 16.813 & 2.205 \\ 2.321 & -0.067 & 5.465 & 5.35 & 2.205 & 14.687 \end{pmatrix}$$

$$FF_1 := b_1(\alpha)\cdot h + \int_0^1 b_1(x)\cdot 5x\,dx \qquad FF_2 := b_2(\alpha)\cdot h + \int_0^1 b_2(x)\cdot 5x\,dx \qquad FF_3 := b_3(\alpha)\cdot h + \int_0^1 b_3(x)\cdot 5x\,dx \qquad FF_4 := b_4(\alpha)\cdot h + \int_0^1 b_4(x)\cdot 5x\,dx$$

$$FF_5 := b_5(\alpha)\cdot h + \int_0^1 b_5(x)\cdot 5x\,dx \qquad FF_6 := b_6(\alpha)\cdot h + \int_0^1 b_6(x)\cdot 5x\,dx$$

$$F_F := \left(FF_1 \;\; FF_2 \;\; FF_3 \;\; FF_4 \;\; FF_5 \;\; FF_6\right)^T$$

$$d_F := K_{FF}^{-1}\cdot F_F$$

$$F_F = \begin{pmatrix} -6.108 \\ 11.603 \\ -18.991 \\ 13.089 \\ -27.25 \\ 3.422 \end{pmatrix} \qquad d_F = \begin{pmatrix} 17.629 \\ 23.592 \\ 0.383 \\ -9.94 \\ -0.952 \\ 1.177 \end{pmatrix}$$

$$u_h(x) := d_0\cdot b_0 + d_{F_1}\cdot b_1(x) + d_{F_2}\cdot b_2(x) + d_{F_3}\cdot b_3(x) + d_{F_4}\cdot b_4(x) + d_{F_5}\cdot b_5(x) + d_{F_6}\cdot b_6(x)$$