

$$PolyFit(x, y, n) := \left[\begin{array}{l} m := \text{length}(x) \quad r := [1..m] \quad c := [1..(n+1)] \quad A := \text{matrix}(m, n+1) + 1 \\ A_{r \, c} := \left(x_r + \left((x_r = 0) \wedge (c = 1) \right) \right)^{c-1} \\ \text{eval} \left(\left(A^T \cdot A \right)^{-1} \cdot \left(A^T \cdot y \right) \right) \end{array} \right]$$

$$PolyVal(p, x) := \left[\text{eval} \left(\sum_{k=1}^{\text{length}(p)} p_k \cdot x^{k-1} \right) \right]$$

$$Data := \begin{bmatrix} 1 & 0.9 \\ 2 & 2.4 \\ 3 & 7 \\ 4 & 17.4 \\ 5 & 30.5 \\ 6 & 48.3 \end{bmatrix}$$

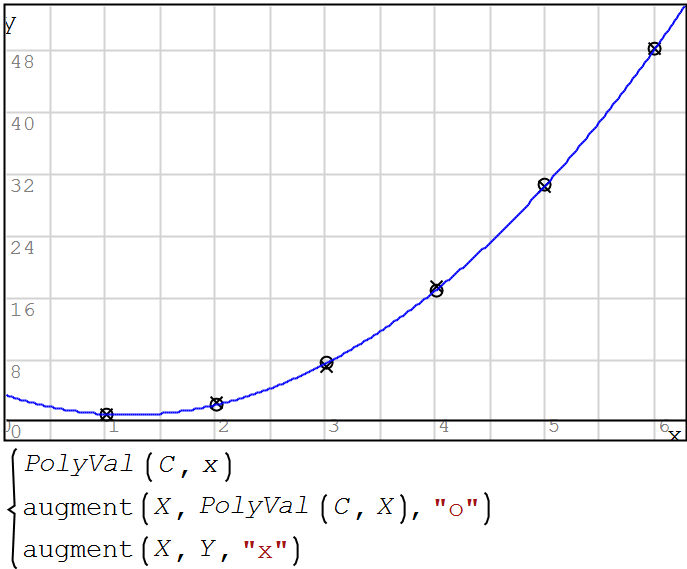
$$n := 2$$

$$[X := \text{col}(Data, 1) \quad Y := \text{col}(Data, 2)]$$

$$C := PolyFit(X, Y, n) = \begin{bmatrix} 3.83 \\ -4.9604 \\ 2.0625 \end{bmatrix}$$

$$PolyVal(C, X) = \begin{bmatrix} 0.9321 \\ 2.1593 \\ 7.5114 \\ 16.9886 \\ 30.5907 \\ 48.3179 \end{bmatrix}$$

$$\text{normi}(Y - PolyVal(C, X)) = 0.5114$$



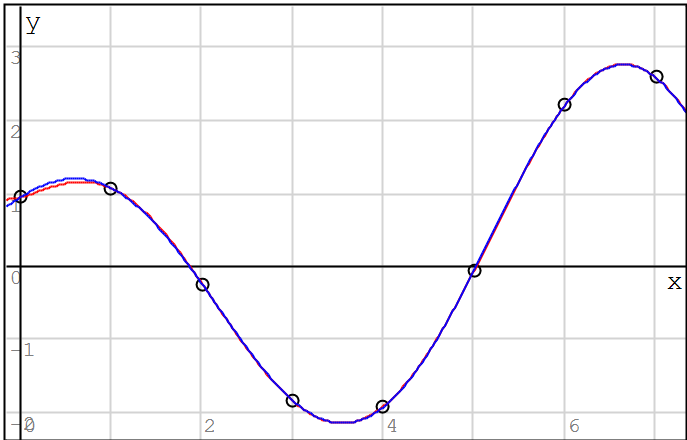
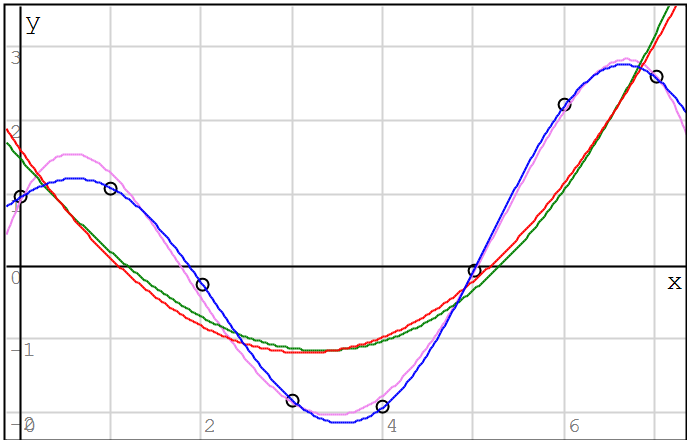
$$f(x) := \sqrt{x+1} \cdot \cos(x-0.3)$$

$$n := 6$$

$$X := [0, 1..7]$$

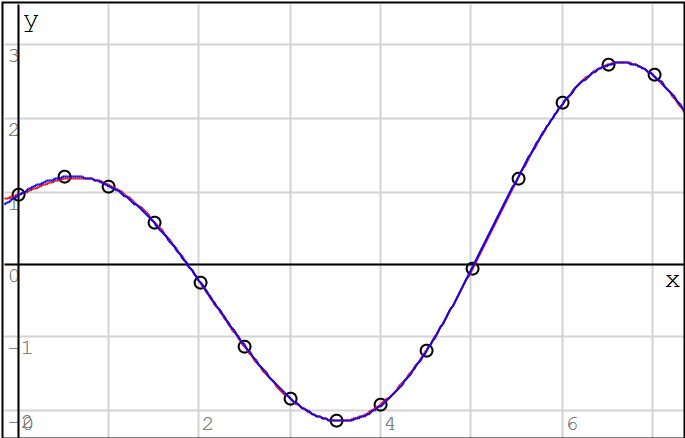
$$Y := \overrightarrow{f(X)}$$

$$\text{normi}(Y - PolyVal(PolyFit(X, Y, n), X)) = 0.009$$



$X := [0, 0.5 \dots 7]$

$Y := \overrightarrow{f(X)}$



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