Horizontal algorithm

$$given:$$
$$e1[68.035, 94.000, 126.625, 166.720] = [f(1.9), f(2.2), f(2.5), f(2.8)]$$
$$find\ the\ polynomial$$

$$e1[68.035, 94.000, 126.625, 166.720]$$
$$e2[25.965, 32.625, 40.095]$$
$$e3[6.660, 7.470]$$
$$e4[0.810]$$
$$d=3$$
$$te_{level}=4$$
$$\Delta X=.3$$
$${}_3te=0.810$$
$${}_dte={}_de^n_{d+1}=c_d\prod_{i=1}^{d}\Delta X(i)$$
$$0.810=c_3\prod_{i=1}^{3}.3(i)=c_3.3*.6*.9=c_3 0.162$$
$$0.810=c_3 0.162$$
$$\frac{0.810}{0.162}=c_3$$
$$c_3=5$$

$$5x^3$$
$$e1[34.295, 53.240, 78.125, 109.760]$$

$$cp-5x^3$$
$$[68.035, 94.000, 126.625, 166.720]-[34.295, 53.240, 78.125, 109.760]$$

$$e1[33.740, 40.760, 48.500, 56.960]$$
$$e2[7.020, 7.740, 8.460]$$
$$e3[0.720, 0.720]$$
$$te_{level}=3$$
$$d=2$$
$$\Delta X=.3$$
$${}_2te=.720$$
$${}_dte={}_de^n_{d+1}=c_d\prod_{i=1}^{d}\Delta X(i)$$
$$0.720=c_2\prod_{i=1}^{2}.3(i)=c_2.3*.6=c_2.18$$
$$0.720=c_2 0.18$$
$$\frac{0.720}{0.18}=c_3$$
$$c_2=4$$

$$4.0x^2$$
$$[14.44, 19.36, 25.00, 31.36, 38.44, 46.24]$$

$$cp-(5x^3+4x^2)$$
$$e1[19.300, 21.400, 23.500, 25.600]$$
$$e2[2.100, 2.100, 2.100]$$

$$te_{level}=2$$
$$d=1$$
$$\Delta X=.3$$
$${}_2te=2.100$$
$${}_dte={}_de^n_{d+1}=c_d\prod_{i=1}^{d}\Delta X(i)$$
$$2.100=c_1\prod_{i=1}^{1}.3(i)=c_1.3$$
$$2.100=.3c_1$$
$$\frac{2.1}{0.3}=c_1$$
$$c_1=7$$

$$5x^3+4x^2+7x+c$$
$$5(1.9)^3+4(1.9)^2+7(1.9)+c=68.035$$
$$34.295+14.44+13.3=62.035$$
$$62.035+c=68.035$$
$$c=6$$

$$f(x)=5x^3+4x^2+7x+6$$

$$5(1.9)^3+4(1.9)^2+7(1.9)+6=68.035$$
$$5(2.2)^3+4(2.2)^2+7(2.2)+6=94$$
$$5(2.5)^3+4(2.5)^2+7(2.5)+6=126.625$$
$$5(2.8)^3+4(2.8)^2+7(2.8)+6=166.720$$
$$[68.035, 94.000, 126.625, 166.720]$$