| | xi | xi^2 | xi^3 | xi^4 | f(xi) | xif(xi) | xi^2f(xi) |
|---|---|---|---|---|---|---|---|
| | -2.00 | 4.00 | -8.00 | 16.00 | 19.01 | -38.02 | 76.04 |
| | -1.00 | 1.00 | -1.00 | 1.00 | 3.99 | -3.99 | 3.99 |
| | 0.00 | 0.00 | 0.00 | 0.00 | -1 | 0 | 0 |
| | 1.00 | 1.00 | 1.00 | 1.00 | 4.01 | 4.01 | 4.01 |
| | 2.00 | 4.00 | 8.00 | 16.00 | 18.99 | 37.98 | 75.96 |
| | 3.00 | 9.00 | 27.00 | 81.00 | 45.00 | 135 | 405 |
| **soma:** | **3.00** | **19.00** | **27.00** | **115.00** | **90.00** | **134.98** | **565.00** |
| | | | | | | | |

$$\begin{bmatrix} 115 & 27 & 19 \\ 27 & 19 & 3 \\ 19 & 3 & 6 \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \end{bmatrix} \begin{bmatrix} 565 \\ 134.98 \\ 90.00 \end{bmatrix}$$

```
>>> import numpy as np

>>> xi=np.array([-2.00,-1.00,0.00,1.00,2.00,3.00])

>>> xi_2=(xi*xi)

>>> xi_3=(xi*xi*xi)

>>> xi_4=(xi_2*xi_2)

>>> f_xi=np.array([19.01,3.99,-1,4.01,18.99,45.00])

>>> xif_xi=(xi*f_xi)

>>> xi_x_f_xi=(xi*xi*f_xi)

>>> soma_xi=np.sum(xi)

>>> soma_xi_2=np.sum(xi_2)

>>> soma_xi_3=np.sum(xi_3)

>>> soma_xi_4=np.sum(xi_4)

>>> soma_f_xi=np.sum(f_xi)

>>> soma_xif_xi=np.sum(xif_xi)

>>> soma_xi_x_f_xi=np.sum(xi_x_f_xi)


>>>
A=np.matrix([[soma_xi_4,soma_xi_3,soma_xi_2],[soma_xi_3,soma_xi_2,soma_xi],[soma_xi_2,
soma_xi,6]])

>>> B=np.matrix([[soma_xi_x_f_xi],[soma_xif_xi],[soma_f_xi]])
```

```
In [27]: a=np.matrix([[5,15,55],[15,55,225],[55,225,979]])

In [28]: a
Out[28]:
matrix([[  5,  15,  55],
        [ 15,  55, 225],
        [ 55, 225, 979]])

In [29]: b=np.array([40,165,724])

In [30]: b
Out[30]: array([ 40, 165, 724])

In [31]: x=np.linalg.solve(a,b)

In [32]: x
Out[32]: array([ 1.5, -1.5,  1. ])

In [33]: p=np.matrix([[115,27,19],[27,19,3],[19,3,6]])

In [34]: q=np.array([565,134.98,90])

In [35]: r=np.linalg.solve(p,q)

In [36]: r
Out[36]: array([ 5.08982143,  0.05189286, -1.14371429])
```

$a_1 = 5.0893$

$a_2 = 0.0515$

$a_3 = -1.1403$