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$$\textcircled{1} \quad \textcircled{2} \quad y = a_0 + a_1 x$$

i	x	y	x^2	xy
1	-2,4	-2,090	5,76	5,016
2	-0,6	-1,460	0,36	0,876
3	-0,4	-1,390	0,16	0,556
4	1,5	-0,7250	2,25	-1,0875
5	2,5	-0,375	6,25	-0,9375
6	3,9	0,115	15,21	0,4485
Σ	4,5	-5,925	29,99	4,8715

$$\begin{vmatrix} nA_0 + \sum x_i A_1 & = \sum y_i \\ \sum x_i A_0 + \sum x_i^2 A_1 & = \sum x_i y_i \end{vmatrix}$$

$$\begin{vmatrix} 6A_0 + 4,5A_1 & = -5,925 \\ 4,5A_0 + 29,99A_1 & = 4,8715 \end{vmatrix}$$

$$\begin{vmatrix} 6 & 4,5 & A_0 \\ 4,5 & 29,99 & A_1 \end{vmatrix} = \begin{vmatrix} -5,925 \\ 4,8715 \end{vmatrix}$$

Encontrando A_1 :

$$18A_0 + 13,5A_1 = -17,775$$

$$18A_0 + 119,6A_1 = 19,486$$

$$-106,46A_1 = -37,261$$

$$A_1 = \frac{-37,261}{-106,46} = \frac{37261}{106460}$$

$$A_1 = 0,35$$

Encontrando A₀:

$$6A_0 + 4,5A_1 = -5,925$$

$$6A_0 + 4,5 * 0,35 = -5,925$$

$$6A_0 = -5,925 - 1,575$$

$$A_0 = \frac{-7,5}{6}$$

$$A_0 = -1,25$$

Solução:

$$y = 0,35x - 1,25$$

② a) $f(x) = A_0 + A_1x + A_2x^2$:

i	x	y	x^2	x^3	x^4	xy	x^2y
1	-2,4	14,544	5,76	-13,824	33,1776	-34,8056	83,77344
2	-0,6	2,664	0,36	-0,216	0,1296	-1,5984	0,95304
3	-0,4	1,704	0,16	-0,064	0,0256	-0,6816	0,27264
4	1,5	-3,825	2,25	3,375	5,0625	-5,7375	-8,60625
5	2,5	-4,125	6,25	15,625	39,0625	-10,3125	-25,78125
6	3,9	-1,521	15,21	59,319	231,2441	-5,9319	-23,13441
Σ	4,5	0,441	29,99	64,215	308,8019	-59,1675	27,48321

$$\begin{cases} 6A_0 + \sum x_i A_1 + \sum x_i^2 A_2 = \sum y_i \\ \sum x_i A_0 + \sum x_i^2 A_1 + \sum x_i^3 A_2 = \sum x_i y_i \\ \sum x_i^2 A_0 + \sum x_i^3 A_1 + \sum x_i^4 A_2 = \sum x_i^2 y_i \end{cases}$$

$$\begin{cases} 6A_0 + 4,5A_1 + 29,99A_2 = 0,441 \\ 4,5A_0 + 29,99A_1 + 64,215A_2 = -59,1675 \\ 29,99A_0 + 64,215A_1 + 308,8019A_2 = 27,48321 \end{cases}$$

Resolvendo o sistema:

$$A_0 = 0,0$$

$$A_1 = -3,9$$

$$A_2 = 0,9$$

Solução:

$$y = 0,9x^2 - 3,9x$$

$$\textcircled{3} \quad \textcircled{a} \quad f(x) = A_0 + A_1x + A_2x^2 + A_3x^3$$

i	x	y	x^2	x^3	x^4	x^5	x^6	xy	x^2y	x^3y
1	-2	-56	4	-8	16	-32	64	112	-224	448
2	-1	-21	1	-1	1	-1	1	21	-21	21
3	1	1	1	1	1	1	1	1	1	1
4	2	12	4	8	16	32	64	24	48	96
5	3	39	9	27	81	243	729	117	351	1053
6	4	94	16	64	256	1024	4096	376	1504	6016
Σ	7	69	35	91	371	1267	4955	651	1653	7635

$$\begin{cases} 6A_0 + \sum x_i A_i + \sum x_i^2 A_2 + \sum x_i^3 A_3 = \sum y_i \\ \sum x_i A_0 + \sum x_i^2 A_i + \sum x_i^3 A_2 + \sum x_i^4 A_3 = \sum x_i y_i \\ \sum x_i^2 A_0 + \sum x_i^3 A_i + \sum x_i^4 A_2 + \sum x_i^5 A_3 = \sum x_i^2 y_i \\ \sum x_i^3 A_0 + \sum x_i^4 A_i + \sum x_i^5 A_2 + \sum x_i^6 A_3 = \sum x_i^3 y_i \end{cases}$$

$$\begin{cases} 6A_0 + 7A_1 + 35A_2 + 91A_3 = 69 \\ 7A_0 + 35A_1 + 91A_2 + 371A_3 = 651 \\ 35A_0 + 91A_1 + 371A_2 + 1267A_3 = 1659 \\ 91A_0 + 371A_1 + 1267A_2 + 4955A_3 = 7635 \end{cases}$$

Retoirando o sistema:

$$\begin{aligned} A_0 &= -6 \\ A_1 &= 9 \\ A_2 &= -4 \\ A_3 &= 2 \end{aligned}$$

Solução

$$y = 2x^3 - 4x^2 + 9x - 6$$

$$④ \text{ a) } y = A_0 e^{a_1 x}$$

i	x	y	ln(y)	x^2	$x + \ln(y)$
1	-2,4	0,115313	-2,160105	5,76	5,184252
2	-1,2	0,599348	-0,636109	1,44	0,763331
3	-0,4	1,462126	0,379899	0,16	-0,151957
4	0,6	5,206414	1,649891	0,36	0,989935
5	1,2	11,155038	2,416831	1,44	2,894269
6	1,8	27,136814	3,300891	3,61	6,271693
↓	-0,3	45,605053	4,946351	1,277	15,951524

$$\begin{cases} m A_0 + \sum x_i a_i = \sum \ln(y_i) \\ \sum x_i a_0 + \sum x_i a_i = \sum x_i \ln(y_i) \end{cases}$$

$$\begin{cases} 6A_0 - 0,3A_1 = 4,946351 \\ -0,3A_0 + 12,77A_1 = 15,951524 \end{cases}$$

Resolvendo o sistema:

$$A_0 = 0,887892$$

$$A_1 = e^{0,887892}$$

$$A_0 = 2,4300018046$$

$$b = 1,269999$$

$$A_1 = e^{1,269999}$$

$$A_1 = 3,5608490015$$

Solução:

$$y = 3,5608490015x + \ln(2,4300018046)$$