

1.

$$\begin{pmatrix} 2 & 1 & 4 & -4 \\ 5 & 5 & 3 & -2 \\ 2 & 2 & -1 & 0 \\ 0 & 5 & -2 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ 3 \\ 9 \\ 11 \end{pmatrix} \div 2$$

$$\begin{pmatrix} 1 & \frac{1}{2} & 2 & -2 \\ 5 & 5 & 3 & -2 \\ 2 & 2 & -1 & 0 \\ 0 & 5 & -2 & 1 \end{pmatrix} \begin{pmatrix} -\frac{1}{2} \\ 3 \\ 9 \\ 11 \end{pmatrix} \begin{matrix} \\ -5f_1 \\ -2f_1 \\ \end{matrix}$$

$$\begin{pmatrix} 1 & \frac{1}{2} & 2 & -2 \\ 0 & \frac{5}{2} & -7 & 8 \\ 0 & 1 & -5 & 4 \\ 0 & 5 & -2 & 1 \end{pmatrix} \begin{pmatrix} -\frac{1}{2} \\ \frac{11}{2} \\ 10 \\ 11 \end{pmatrix} \begin{matrix} \\ \updownarrow \\ \\ \end{matrix}$$

$$\begin{pmatrix} 1 & \frac{1}{2} & 2 & -2 \\ 0 & 1 & -5 & 4 \\ 0 & \frac{5}{2} & -7 & 8 \\ 0 & 5 & -2 & 1 \end{pmatrix} \begin{pmatrix} -\frac{1}{2} \\ 10 \\ \frac{11}{2} \\ 11 \end{pmatrix}$$

día

mes

año

2.

$$\begin{pmatrix} 2 & 0 & 2 \\ 2 & 0 & -2 \\ 4 & 2 & -3 \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \div 2$$

$$\begin{pmatrix} 1 & 0 & 1 \\ 2 & 0 & -2 \\ 4 & 2 & -3 \end{pmatrix} \begin{pmatrix} \frac{1}{2} & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{matrix} \swarrow * -2 \\ \searrow * -4 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 0 & -4 \\ 0 & 2 & -7 \end{pmatrix} \begin{pmatrix} \frac{1}{2} & 0 & 0 \\ -1 & 1 & 0 \\ -2 & 0 & 1 \end{pmatrix} \begin{matrix} \swarrow \\ \searrow \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 2 & -7 \\ 0 & 0 & -4 \end{pmatrix} \begin{pmatrix} \frac{1}{2} & 0 & 0 \\ -2 & 0 & 1 \\ -1 & 1 & 0 \end{pmatrix} \begin{matrix} * \frac{1}{2} \\ * -\frac{1}{4} \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & -\frac{7}{2} \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \frac{1}{2} & 0 & 0 \\ -1 & 0 & \frac{1}{2} \\ \frac{1}{4} & -\frac{1}{4} & 0 \end{pmatrix} \begin{matrix} \swarrow * -1 \\ \searrow * \frac{7}{2} \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \frac{1}{4} & \frac{1}{4} & 0 \\ -\frac{1}{8} & -\frac{7}{8} & \frac{1}{2} \\ \frac{1}{4} & -\frac{1}{4} & 0 \end{pmatrix} \begin{matrix} \text{Matriz} \\ \text{Identidad} \end{matrix}$$

día

mes

año

$$\left(\begin{array}{cccc|c} 1 & 0 & 9/2 & -4 & -11/2 \\ 0 & 1 & -5 & 4 & 10 \\ 0 & 0 & 11/2 & -2 & -39/2 \\ 0 & 0 & 23 & -19 & -39 \end{array} \right)$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 9/2 & -4 & -11/2 \\ 0 & 1 & -5 & 4 & 10 \\ 0 & 0 & 1 & -4/11 & -39/11 \\ 0 & 0 & 23 & -19 & -39 \end{array} \right)$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & -26/11 & 115/11 \\ 0 & 1 & 0 & 24/11 & -85/11 \\ 0 & 0 & 1 & -4/11 & -39/11 \\ 0 & 0 & 0 & -117/11 & 468/11 \end{array} \right)$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & -26/11 & 115/11 \\ 0 & 1 & 0 & 24/11 & -85/11 \\ 0 & 0 & 1 & -4/11 & -39/11 \\ 0 & 0 & 0 & 1 & -4 \end{array} \right)$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & -5 \\ 0 & 0 & 0 & 1 & -4 \end{array} \right)$$

$$x_1 = 1$$

$$x_2 = 1$$

$$x_3 = -5$$

$$x_4 = -4$$

3.

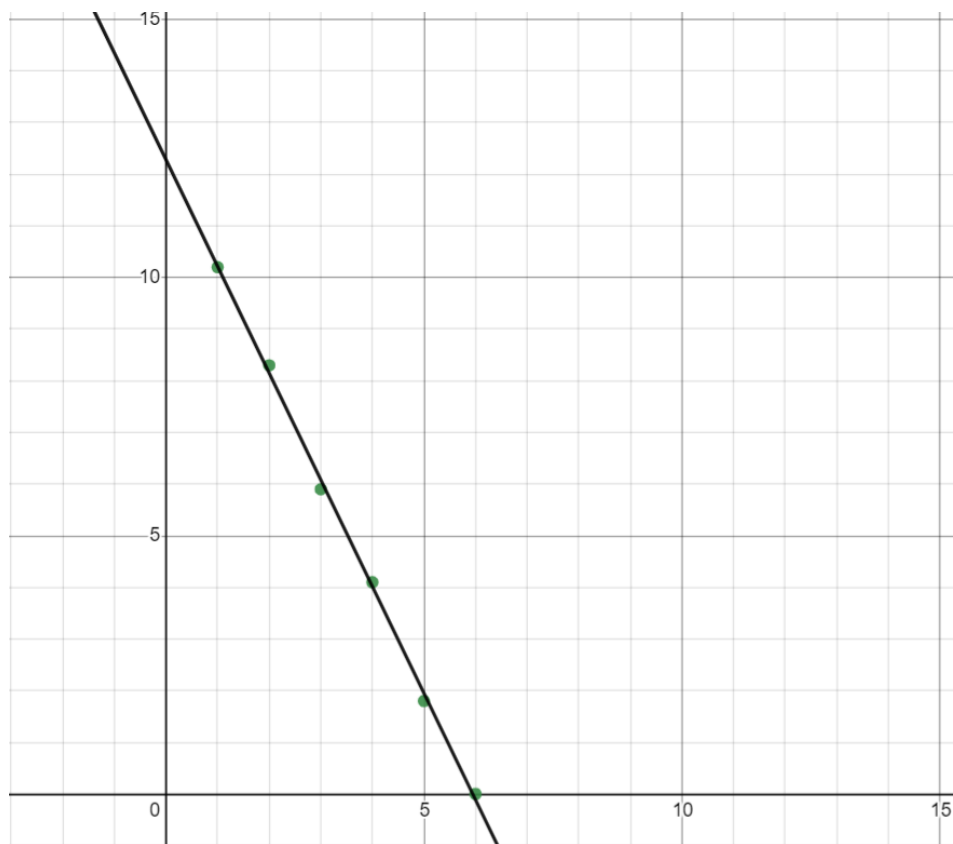
| | X | Y | X*Y | X^2 |
|-----------|-----|------|------|-----|
| | 1 | 10,2 | 10,2 | 1 |
| | 2 | 8,3 | 16,6 | 4 |
| | 3 | 5,9 | 17,7 | 9 |
| | 4 | 4,1 | 16,4 | 16 |
| | 5 | 1,8 | 9 | 25 |
| | 6 | 0 | 0 | 36 |
| Sumatoria | 21 | 30,3 | 69,9 | 91 |
| Promedio | 3,5 | 5,05 | | |

$$a_1 = \frac{6 * 69,9 - 21 * 30,3}{6 * 91 - 21^2} = -2,0657143$$

$$a_0 = 5,05 - (-2,0657143) * 3,5 = 12,28$$

$$\text{Formula: } y = a_0 + (a_1 * x)$$

$$y = 12,28 - 2,0657143x$$



4.

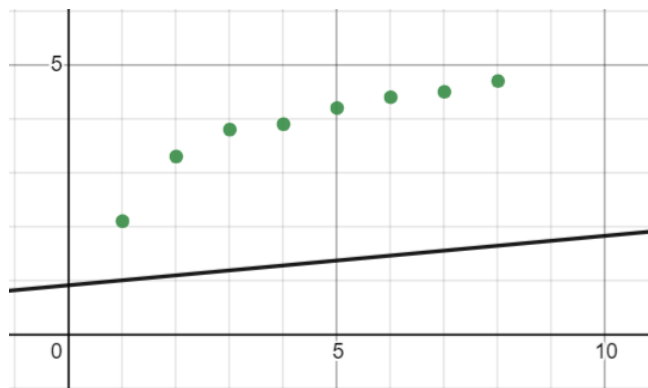
Transformación
Exponencial

| | X | Y | Ln Y | X * Ln Y | X^2 |
|-----------|-----|--------|------------|------------|-----|
| | 1 | 2,1 | 0,74193734 | 0,74193734 | 1 |
| | 2 | 3,3 | 1,19392247 | 2,38784494 | 4 |
| | 3 | 3,8 | 1,33500107 | 4,0050032 | 9 |
| | 4 | 3,9 | 1,36097655 | 5,44390621 | 16 |
| | 5 | 4,2 | 1,43508453 | 7,17542263 | 25 |
| | 6 | 4,4 | 1,48160454 | 8,88962725 | 36 |
| | 7 | 4,5 | 1,5040774 | 10,5285418 | 49 |
| | 8 | 4,7 | 1,54756251 | 12,3805001 | 64 |
| Sumatoria | 36 | 30,9 | 10,6001664 | 51,5527834 | 204 |
| Promedio | 4,5 | 3,8625 | 1,3250208 | | |

$$a_1 = \frac{8 \cdot 51,5527834 - 36 \cdot 10,6001664}{8 \cdot 204 - 36^2} = 0,09171511$$

$$a_0 = 1,3250208 - 0,09171511 \cdot 4,5 = 0,91230281$$

$$y = 0,91230281 + 0,09171511x \text{ Esta función no aproxima a los puntos}$$

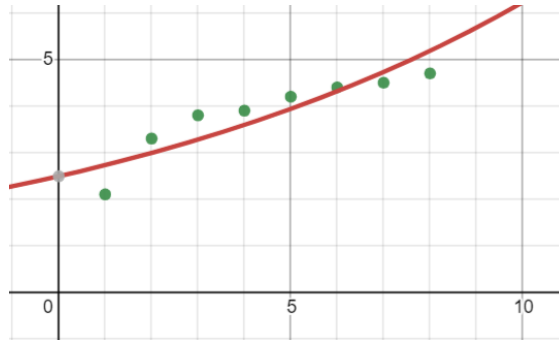


Transformación inversa:

$$\alpha = e^{0,91230281} = 2,490050048$$

$$\beta = 0,09171511$$

$$y = 2,490050048e^{0,09171511x}$$



Razon de
crecimiento

| | X | Y | 1/x | 1/y | (1/X)*(1/Y) | (1/X)^2 |
|------------------|-----|--------|------------|------------|-------------|------------|
| | 1 | 2,1 | 1 | 0,47619048 | 0,47619048 | 1 |
| | 2 | 3,3 | 0,5 | 0,3030303 | 0,15151515 | 0,25 |
| | 3 | 3,8 | 0,33333333 | 0,26315789 | 0,0877193 | 0,11111111 |
| | 4 | 3,9 | 0,25 | 0,25641026 | 0,06410256 | 0,0625 |
| | 5 | 4,2 | 0,2 | 0,23809524 | 0,04761905 | 0,04 |
| | 6 | 4,4 | 0,16666667 | 0,22727273 | 0,03787879 | 0,02777778 |
| | 7 | 4,5 | 0,14285714 | 0,22222222 | 0,03174603 | 0,02040816 |
| | 8 | 4,7 | 0,125 | 0,21276596 | 0,02659574 | 0,015625 |
| Sumatoria | 36 | 30,9 | 2,71785714 | 2,19914508 | 0,9233671 | 1,52742205 |
| Promedio | 4,5 | 3,8625 | 0,33973214 | 0,27489313 | 0,11542089 | 0,19092776 |

$$a_1 = \frac{8 * 0,9233671 - 2,71785714 * 2,19914508}{8 * 1,52742205 - 2,71785714^2}$$

$$a_0 = 0,27489313 - 0,29176141 * 0,33973214$$

| | |
|-----|------------|
| a1= | 0,29176141 |
| a0= | 0,1757724 |

| | |
|-------------------|-----------|
| $\alpha = 1/a_0$ | 5,6891752 |
| $\beta = a_1/a_0$ | 1,6598818 |

$$y = 5,6891752 * \frac{x}{2,679470667 + x}$$

