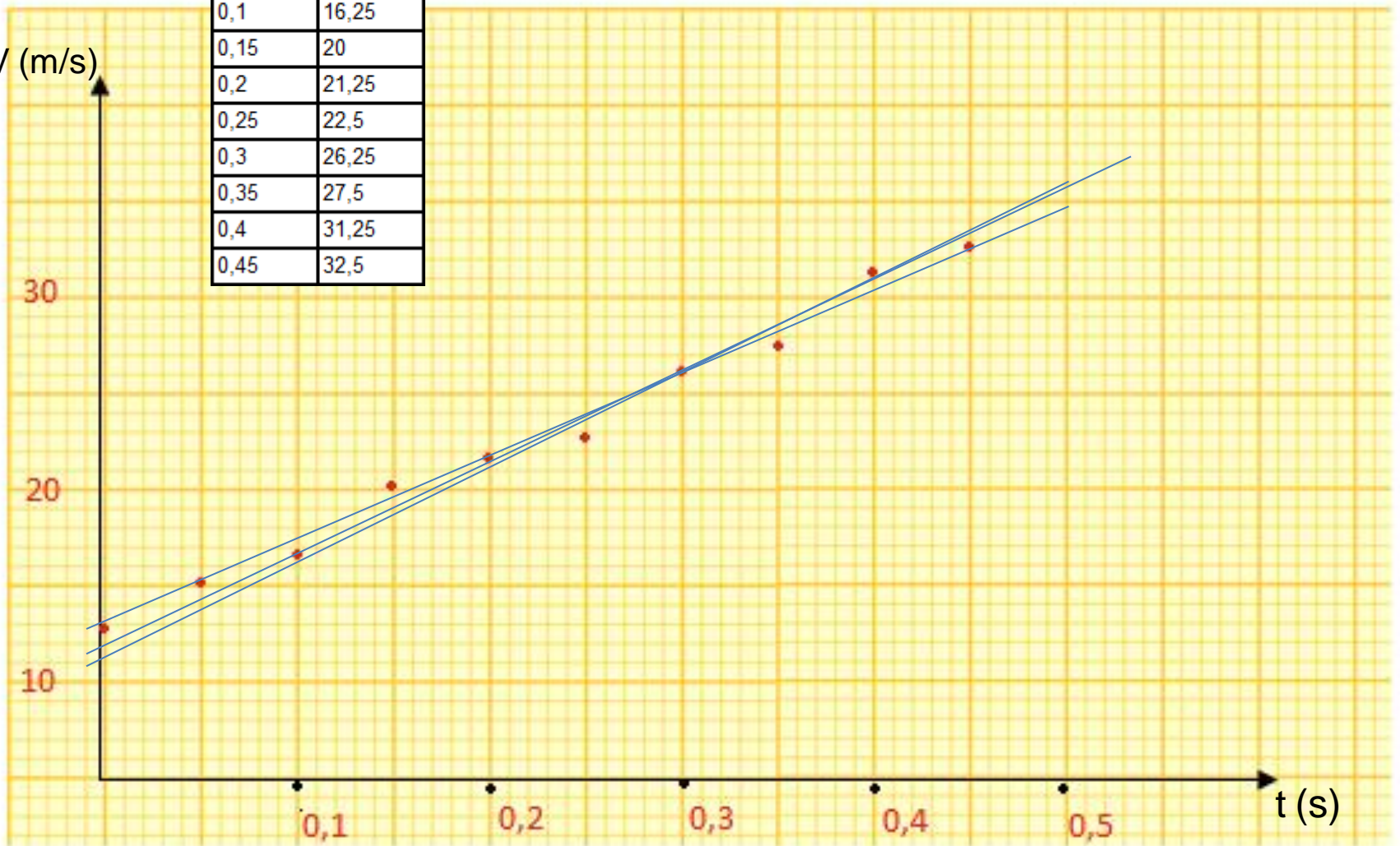


Tratamiento de datos

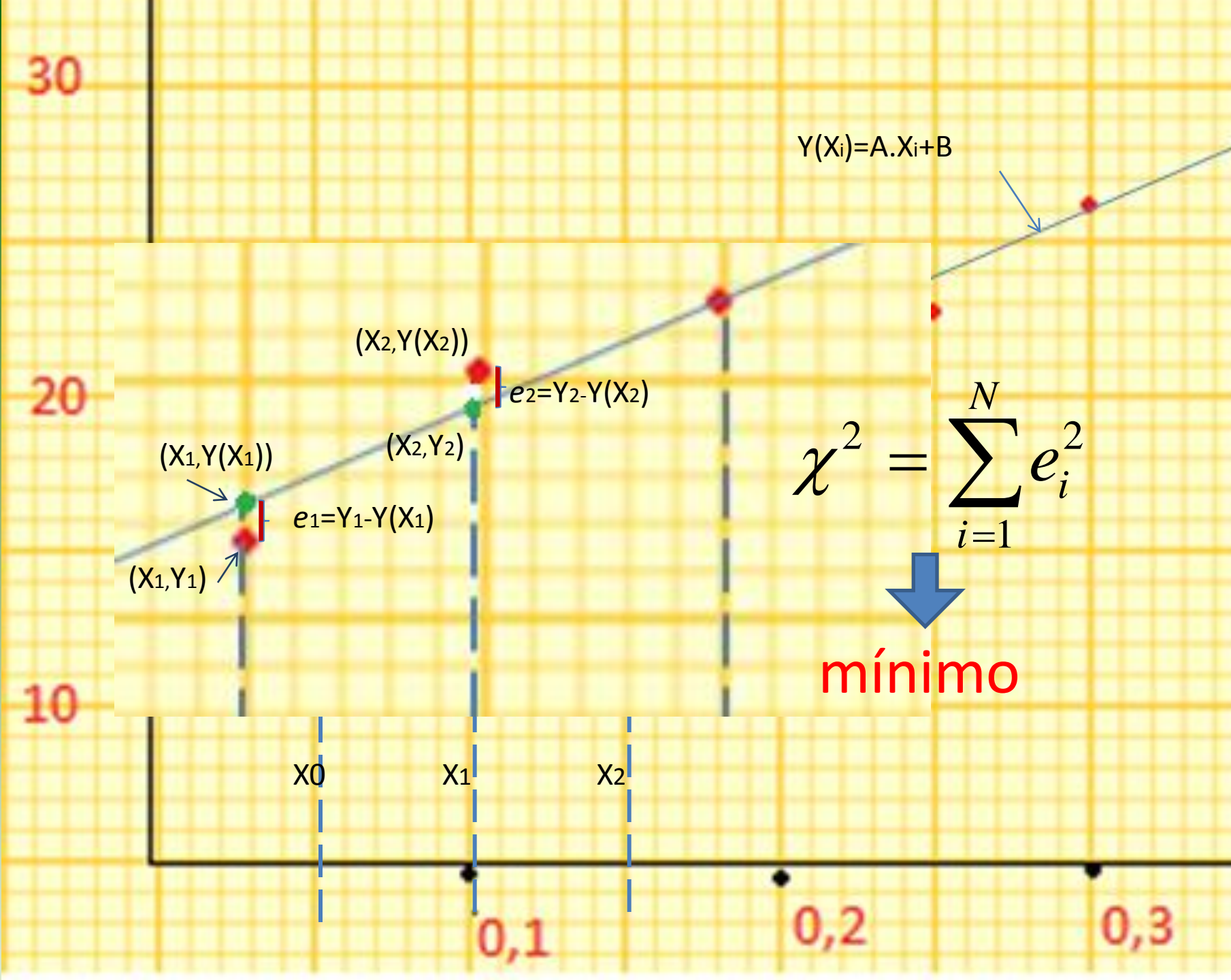
Ajuste por
Regresión Lineal

t(s)	V (m/s)
0	12,5
0,05	15
0,1	16,25
0,15	20
0,2	21,25
0,25	22,5
0,3	26,25
0,35	27,5
0,4	31,25
0,45	32,5

V (m/s)



t (s)



$$\chi^2 = \sum_{i=1}^N e_i^2 \quad e_i = Y_i - (A \cdot X_i + B) \quad i = 1, 2, \dots, N$$

$$\frac{\partial \chi^2}{\partial A} = 0 \quad \text{y} \quad \frac{\partial \chi^2}{\partial B} = 0$$

$$\frac{\partial \chi^2}{\partial A} = \sum_{i=1}^N \frac{\partial (Y_i - AX_i - B)^2}{\partial A} = 2 \cdot \sum_{i=1}^N [(Y_i - AX_i - B)(-X_i)] = 0$$

$$\frac{\partial \chi^2}{\partial B} = \sum_{i=1}^N \frac{\partial (Y_i - AX_i - B)^2}{\partial B} = 2 \cdot \sum_{i=1}^N [(Y_i - AX_i - B)(-1)] = 0$$

$$A \sum_{i=1}^N (X_i)^2 + B \sum_{i=1}^N (X_i) - \sum_{i=1}^N (Y_i \cdot X_i) = 0$$

$$A \sum_{i=1}^N (X_i) + B \cdot N - \sum_{i=1}^N (Y_i) = 0$$



$$A = \frac{N \sum xy - \sum x \sum y}{N \sum x^2 - (\sum x)^2}$$

$$B = \frac{\sum y \sum x^2 - \sum xy \sum x}{N \sum x^2 - (\sum x)^2}$$

¿A y B son exactos??

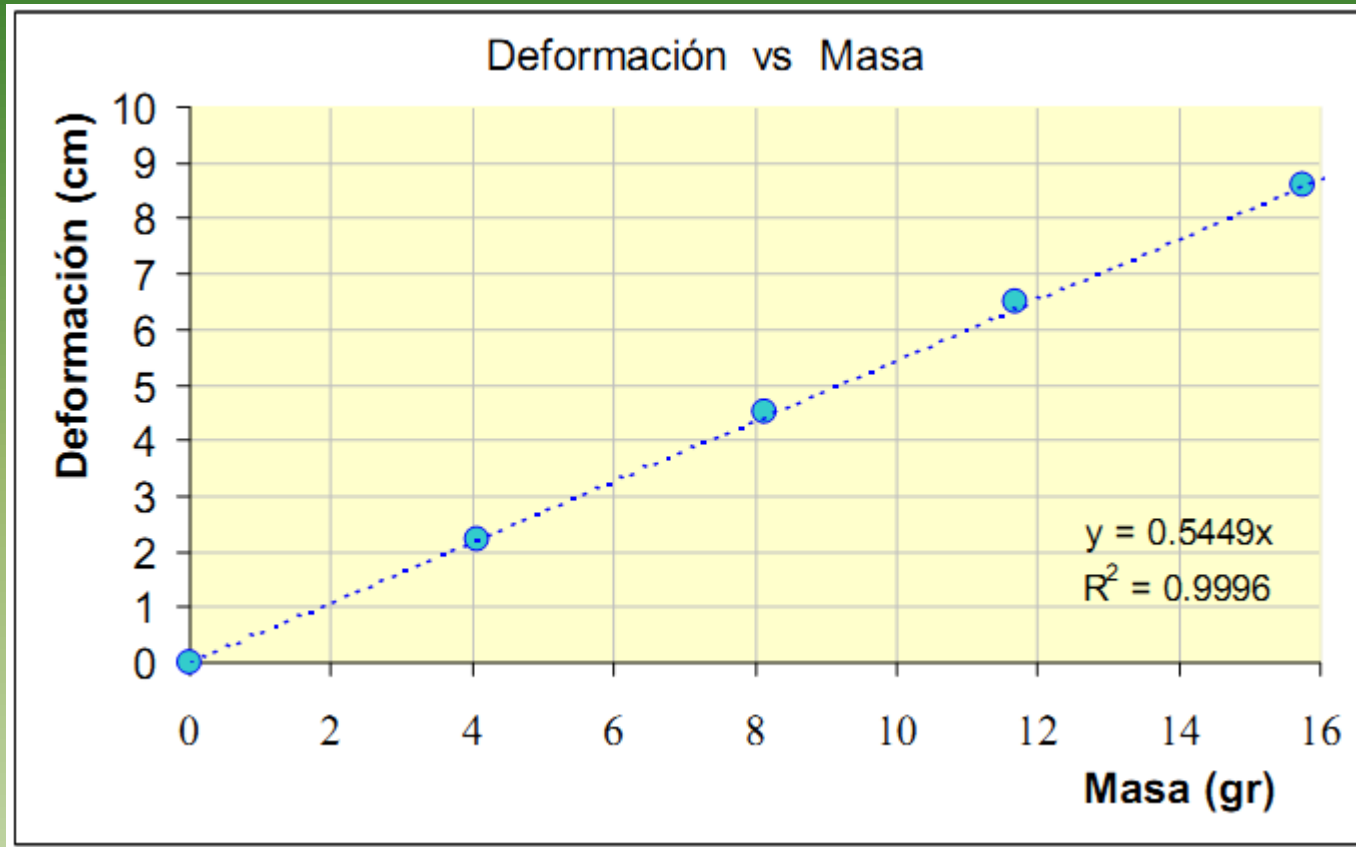
$$\sigma_{X_i} \ll \sigma_{Y_i}$$

$$\sigma_A \approx \sqrt{\sum_{i=1}^N \left(\frac{\partial A}{\partial y_i} \right)^2} \sigma_{Y_i} \quad \text{y} \quad \sigma_B \approx \sqrt{\sum_{i=1}^N \left(\frac{\partial B}{\partial y_i} \right)^2} \sigma_{Y_i}$$

$$\sigma_A = \sigma_y \sqrt{\frac{N}{N \sum x^2 - (\sum x)^2}} \quad \sigma_B = \sigma_y \sqrt{\frac{\sum x^2}{N \sum x^2 - (\sum x)^2}}$$

$$\sigma_Y = \sqrt{\frac{\sum_{i=1}^N e_i^2}{N-2}}$$

¿Cómo se evalúa el ajuste?



**Coeficiente de
correlación lineal R**

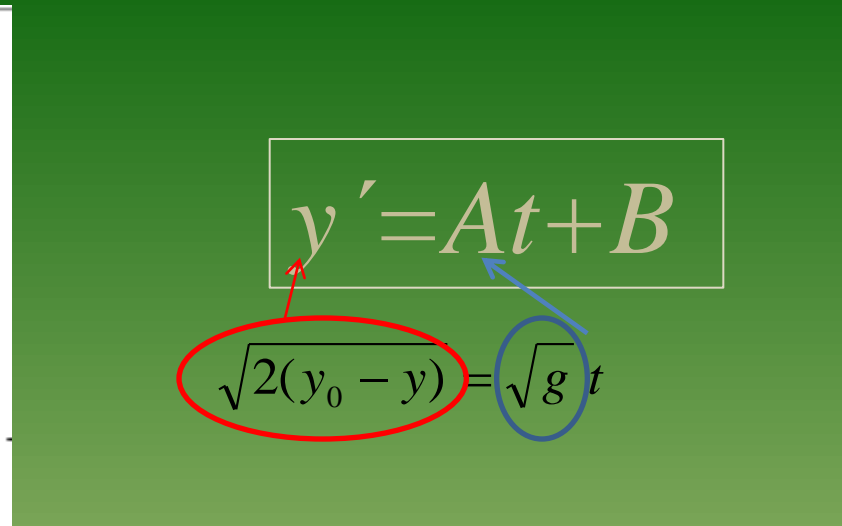
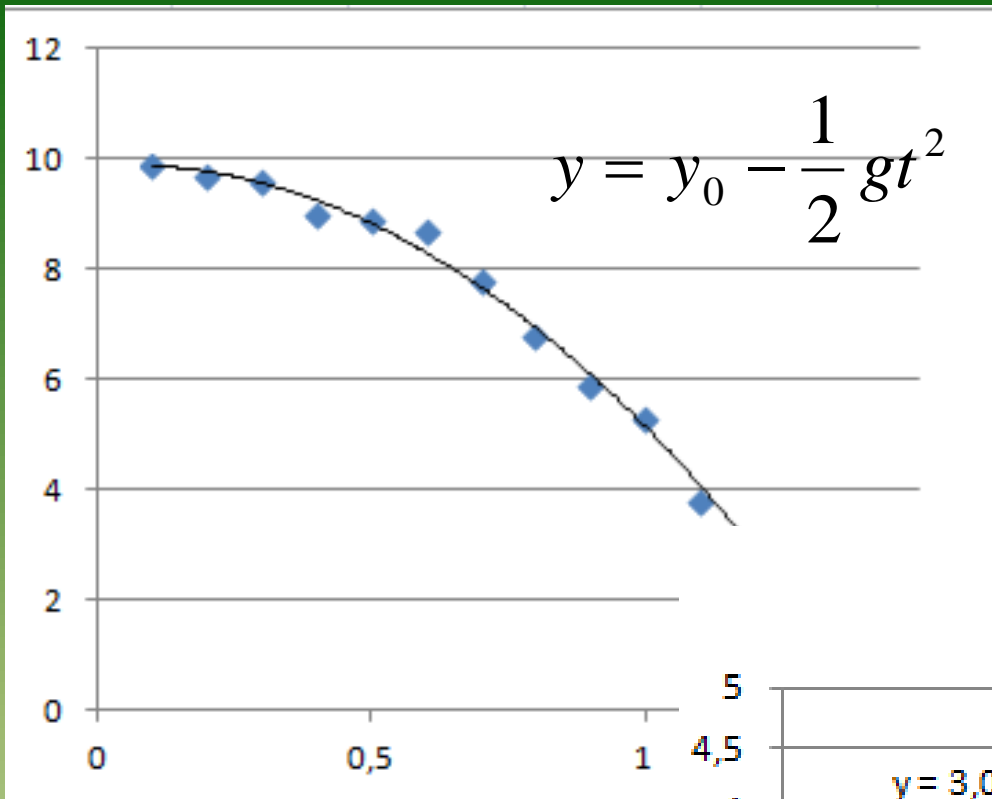
$$R = \frac{\overline{XY} - \bar{X}\bar{Y}}{\sqrt{(\overline{X^2} - \bar{X}^2)(\overline{Y^2} - \bar{Y}^2)}}$$

**R toma valores entre 1 y -1
pasando por el cero.**

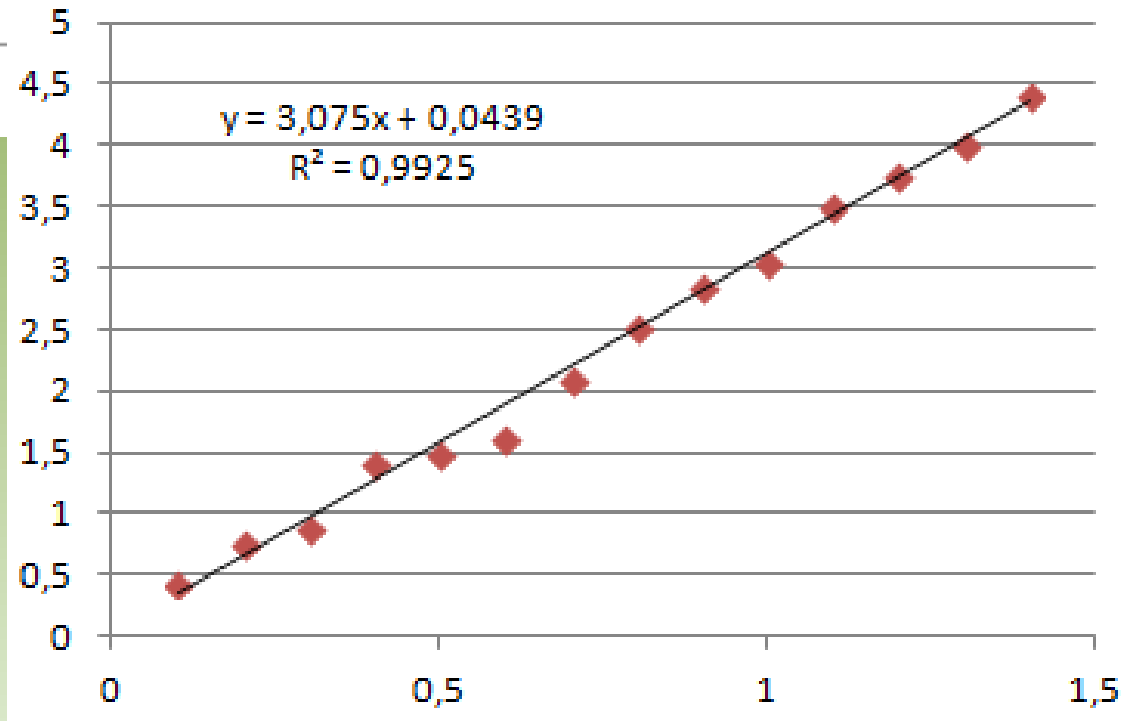
Ejercicio 2

t(seg)	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,1	1,2	1,3	1,4
y(m)	9,9	9,7	9,6	9,0	8,9	8,7	7,8	6,8	5,9	5,3	3,8	2,9	1,9	0,3





y'



$$g = A^2$$

$$\sigma_g ???$$