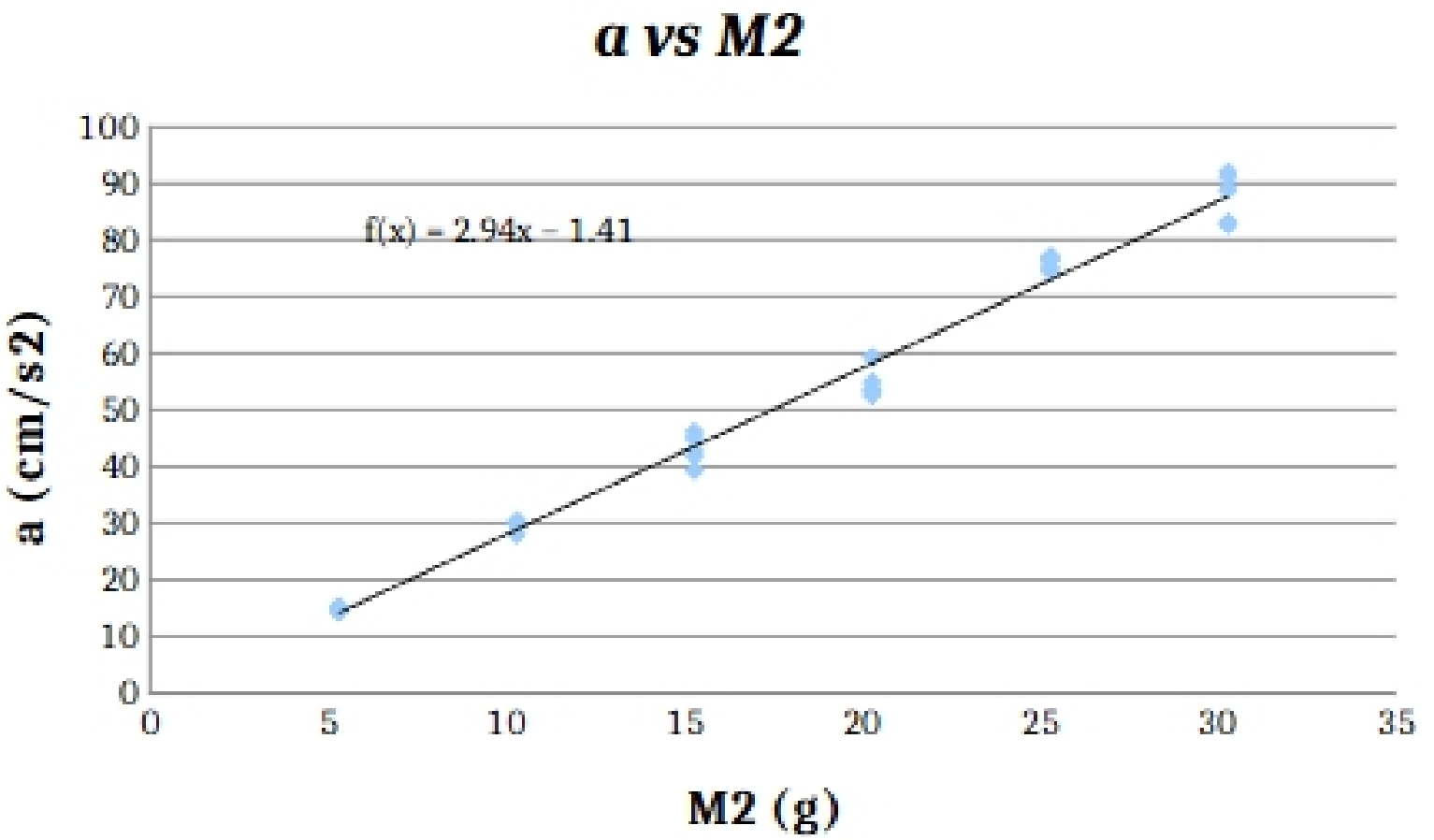
VI-1

The values obtained by performing the experiment have been tabulated as follows:

M_2 (g)	a (cm/s^2)
5.3	15
5.3	15.3
5.3	14.2
5.3	14.4
5.3	14.7
10.3	30.3
10.3	30.4
10.3	29.8
10.3	29.8
10.3	28
15.3	44.9
15.3	41.9
15.3	46.1
15.3	42.9
15.3	39.3
20.3	52.6
20.3	53.4
20.3	59.3
20.3	53.6
20.3	54.9
25.3	77.1
25.3	75
25.3	74.4
25.3	76.7
25.3	76.2
30.3	92
30.3	91.1
30.3	82.7
30.3	83.1
30.3	88.9

Using EXCEL, I plotted a graph for the above values. The graph is as follows:



Using the LINEST function in Excel, I calculated the values of the slope and the intercept and the uncertainties in those quantities, as shown below:

Slope ***s*** ($cm/s^2.g$)	2.940571429	-1.408838095	Intercept ***b*** (cm/s^2)
σ_s	0.064406991	1.271539289	σ_b

$$\mathbf{S = 2.94 \pm 0.06}\ cm/s^2.g$$

$$\mathbf{b = -1 \pm 1}\ cm/s^2$$

We know that,

$M_1 = 295.6$ g

$M_2 = 30.3$ g

$$s = \frac{g}{M_1 + M_2}$$

$$g = s(M_1 + M_2)$$

$$= 2.94(295.6 + 30.3)$$

$$g = 957.564 \text{ cm/s}^2$$

$$g \pm \sigma_s = 960 \pm 20 \quad \mathbf{cm/s^2}$$