

Experiment F0: Solutions

8.01X F01

1. My LVPS was set at 6.0 Volts
2. My data for the trials at 3 different distances is

	V cap	V cap	V cap
distance	260 mm	130 mm	65 mm
	0.125	0.091	0.066
	0.132	0.092	0.065
	0.125	0.091	0.064
	0.126	0.091	0.064
	0.125	0.09	0.066
ave	0.1266	0.091	0.065
st dev	0.0030	0.0007	0.0010

3. The average time for each distance is calculated using

$$t = \frac{2 \bar{V}_{cap}}{V_{LVPS}} = \frac{RC \bar{V}_{cap}}{V_{LVPS}}$$

average time (s)	0.2306	0.1657	0.1184
distance (mm)	260	130	65

So the final results of distance vs t^2 are given in the table below

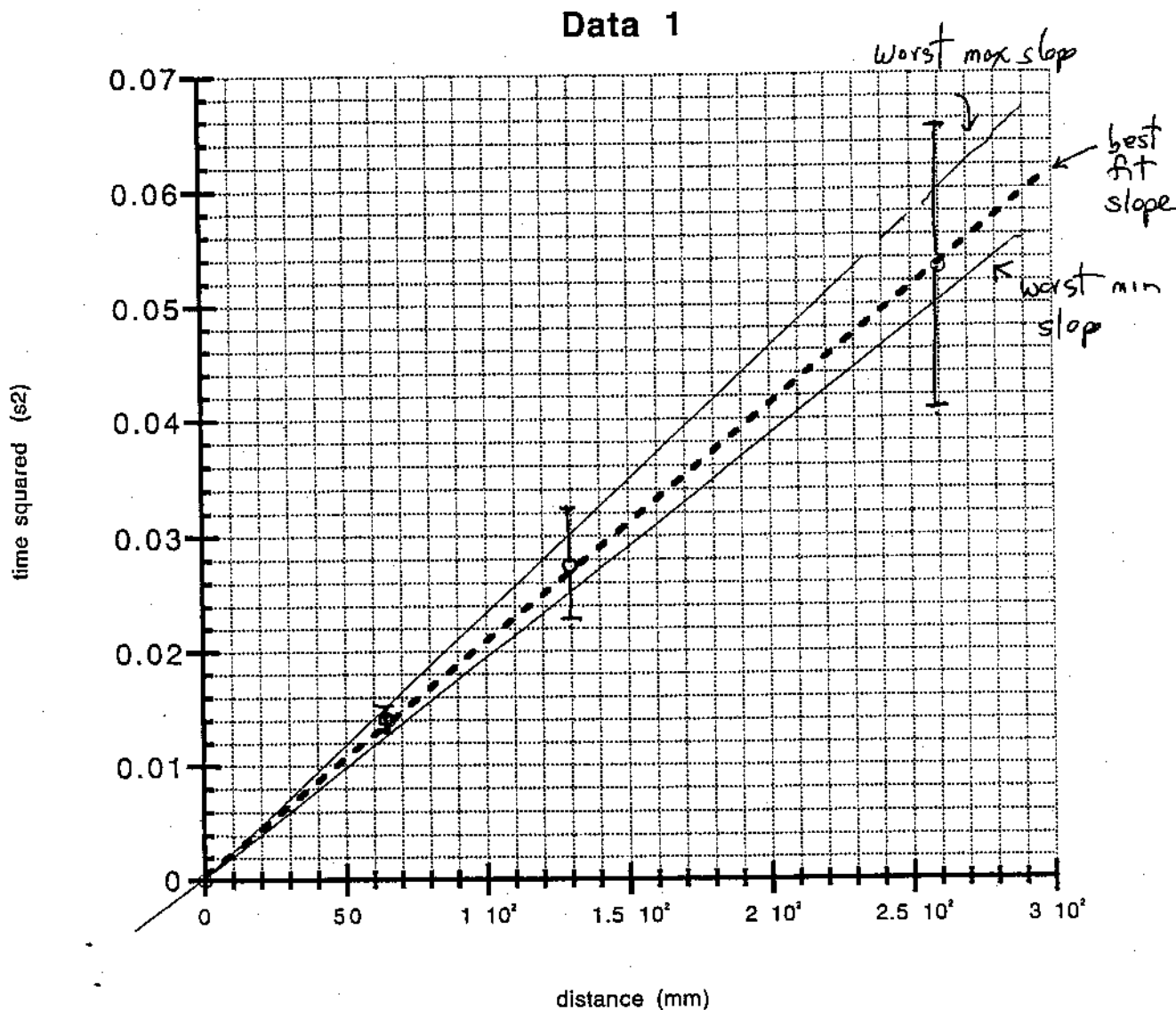
distance (mm)	time t^2 (s ²)
0	0
65	0.0140
130	0.0275
260	0.0532

4.

best fit : $\text{slope} = \frac{2}{\bar{g}} = 0.000204 \frac{\text{s}^2}{\text{mm}}$

$$\bar{g} = 9.80 \text{ m/s}^2$$

----- $y = 0.00046 + 0.000204x$ $R = 1$



Since $h = \frac{1}{2} g t^2$, $t^2 = \frac{2}{g} h$

slope = $\frac{2}{g}$,

$$g = \frac{2}{\text{slope}}$$