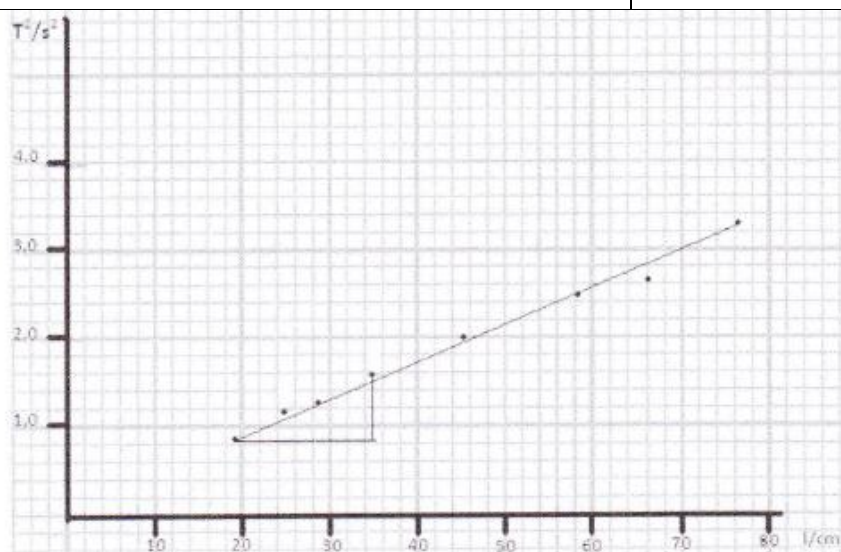


Υποδείγματα : Πείραμα 2

ΠΙΝΑΚΑΣ Α						ΠΙΝΑΚΑΣ Β			
A/A	l/cm	t/s	T/s	T ² /s ²	T ² /s ²	A/A	l/cm	T ² /s ²	
1	77.5	18.0	1.80	3.2400	3.24	1	77.5	3.24	3.2
2	72.3	17.0	1.70	2.8900	2.89	2	72.3	2.89	2.9
3	62.7	15.6	1.56	2.4336	2.43	3	62.7	2.43	2.4
4	55.6	15.2	1.52	2.3104	2.31	4	55.6	2.31	2.3
5	47.9	14.0	1.40	1.9600	1.96	5	47.9	1.96	2.0
6	41.2	13.0	1.30	1.6900	1.69	6	41.2	1.69	1.7
7	34.7	11.6	1.10	1.3456	1.35	7	34.7	1.35	1.4
8	27.5	10.4	1.04	1.0816	1.08	8	27.5	1.08	1.1
9	19.5	9.1	0.91	0.8281	0.83	9	19.5	0.83	0.8



$$l_1 = 25 \text{ cm}$$

$$T_1^2 = 0 \text{ sec}^2$$

$$l_2 = 47,9 \text{ cm}$$

$$T_2^2 = 2,0 \text{ sec}^2$$

$$\Delta l = l_2 - l_1 = 47,9 - 25 = 22,9 \text{ cm}$$

$$\Delta T_1^2 = T_1^2 - T_2^2 = 15 \text{ sec}^2$$

$$\frac{\Delta T_1^2}{\Delta l} = \frac{1 \text{ sec}^2}{22,9 \text{ cm}} = \frac{10 \text{ sec}^2}{22,9 \text{ m}} = 4,3668 \frac{\text{sec}^2}{\text{m}} \approx 4,45 \text{ s}^2/\text{m} \quad (1)$$

Από τη θεωρία γνωρίζουμε ότι ισχύει ο τύπος

$$T = 2\pi \sqrt{\frac{l}{g}} \Rightarrow T^2 = \frac{4\pi^2}{g} * l \Rightarrow \Delta T^2 = \frac{4\pi^2}{g} * \Delta l \Rightarrow \frac{\Delta T^2}{\Delta l} = \frac{4\pi^2}{g} \Rightarrow \frac{\Delta T^2}{\Delta l} = \frac{4\pi^2}{g} \quad (2)$$

Από τις σχέσεις (1) και (2) προκύπτει ότι:

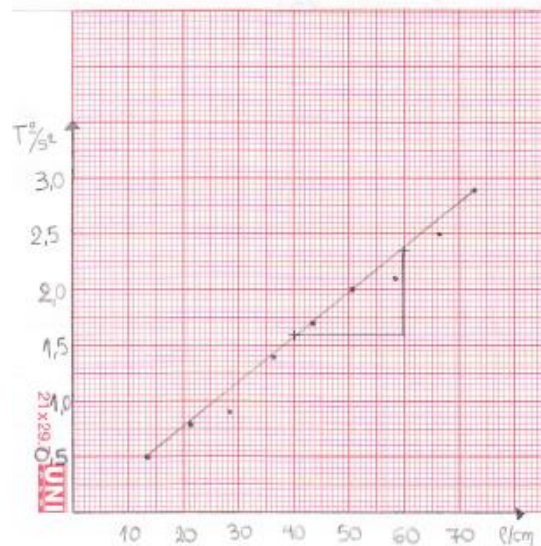
$$\frac{4\pi^2}{g} = 4,4 \Rightarrow g = \frac{4\pi^2}{4,4} \Rightarrow g = \frac{4 * (3,14)^2}{4,4} = \frac{9,9}{1,1} = 9 \text{ m/s}^2$$

3. Πειράμα Α

	ℓ/cm	t/sec	T/s	T ² /s ²
1	72,30	17,14	1,714	2,937796
2	66,60	15,66	1,566	2,452356
3	58,10	14,53	1,453	2,111209
4	50,60	14,26	1,426	2,033476
5	43,60	12,96	1,296	1,679616
6	36,10	11,88	1,188	1,411344
7	28,60	9,94	0,994	0,988036
8	21,50	8,68	0,868	0,753424
9	13,80	7,06	0,706	0,498436

Πειράμα Β

ℓ/cm	T ² /s ²
72,30	2,94
66,60	2,45
58,10	2,11
50,60	2,03
43,60	1,68
36,10	1,41
28,60	0,98
21,50	0,75
13,80	0,50



$$\ell_1 = 40 \text{ cm}$$

$$\Delta \ell = \ell_2 - \ell_1 = 60 - 40 = 20 \text{ cm}$$

$$\ell_2 = 60 \text{ cm}$$

$$\Delta T^2 = T_2^2 - T_1^2 = 2,35 - 1,6 = 0,75 \text{ s}^2$$

$$T_1^2 = 1,6 \text{ s}^2$$

$$T_2^2 = 2,35 \text{ s}^2$$

$$\frac{\Delta T^2}{\Delta \ell} = \frac{0,75}{20} \times 100 = 3,75 \frac{\text{s}^2}{\text{cm}}$$

①

Από τη θεωρία έχουμε

$$T = 2\pi \sqrt{\frac{\ell}{g}} \Rightarrow T^2 = \frac{4\pi^2}{g} \ell \Rightarrow \Delta T^2 = \frac{4\pi^2}{g} \Delta \ell \Rightarrow \frac{\Delta T^2}{\Delta \ell} = \frac{4\pi^2}{g} \quad \text{②}$$

