

(1)

سنة ١٤٣١

experience one.

Name: simple pendulum movement
motion

Aim: Determination of Acceleration gravity
using a simple pendulum.

Theory: simple pendulum consists of,

1- mass

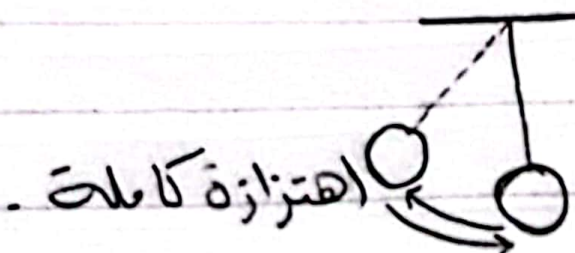
2- string.

Tools: mass, string, stop watch, ساعة بند.

resters: Determination of Acceleration
gravity.

Complete oscillation.

The motion in which the object
pass by a point in its path 2 times.



(2)

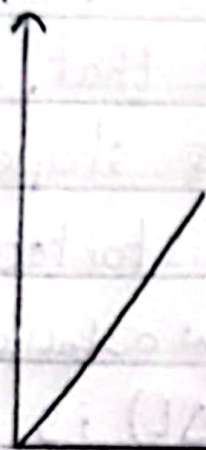
* Amplitude

Maximum displacement from equilibrium position.

* simple harmonic motion.

The motion that repeats itself in direction and magnitude with time at equal periods.

L (cm)



slope = $4\pi^2$

T^2 (sec²)

$$T = 2\pi \sqrt{\frac{L}{g}}$$

→ $\frac{L}{g}$

→ Acceleration.

$$T^2 = 4\pi^2 \frac{L}{g}$$

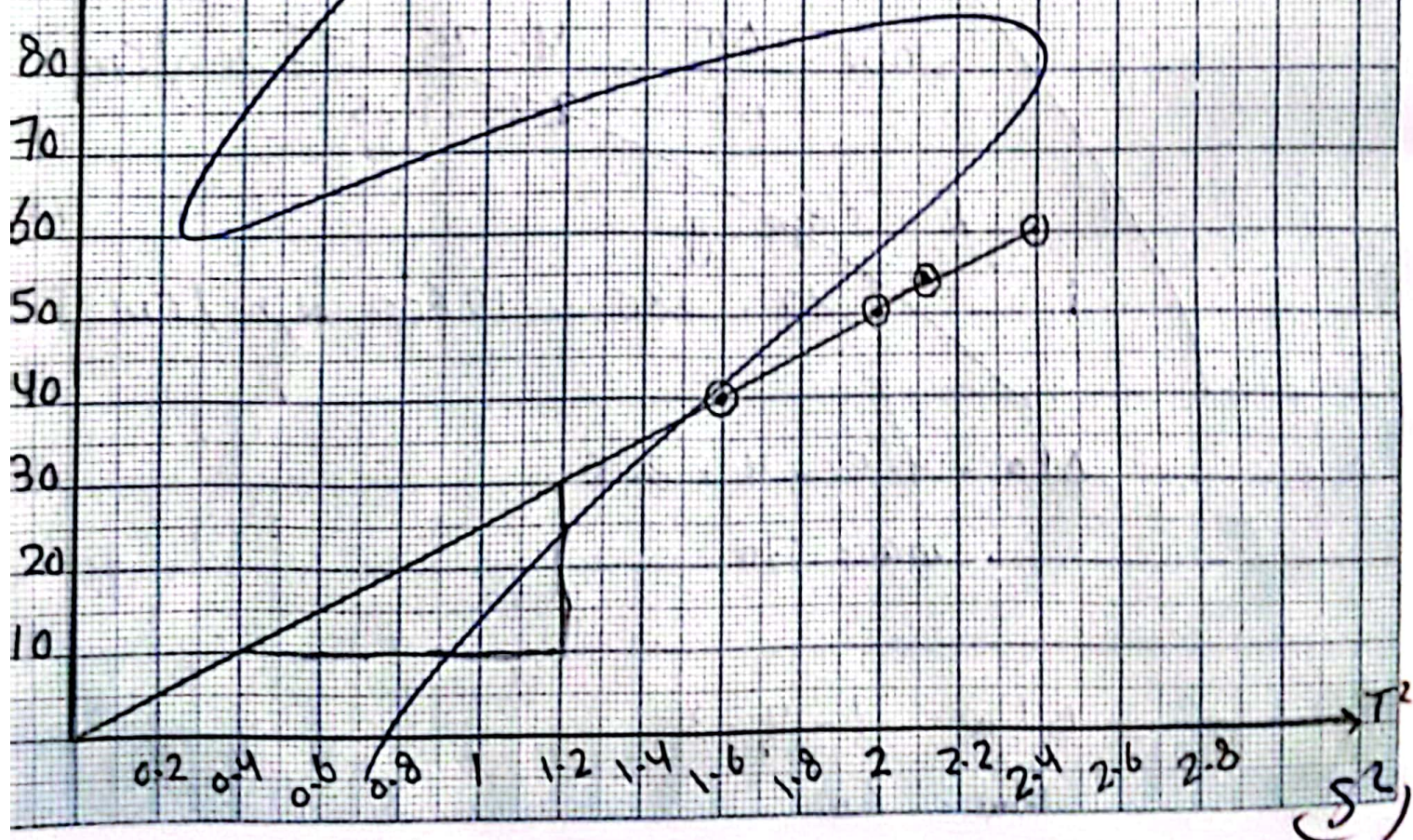
$$* g = 4\pi^2 \frac{L}{T^2} = 4\pi^2 \times \text{slope.}$$

L	T_{10}	$\frac{T_{10}}{L}$	T^2
40	12.85	1.285	1.65
50	14.29	1.429	2.04
55	14.77	1.477	2.18
60	15.53	1.553	2.4

L (cm)

$$\text{slope} = \frac{\Delta L}{\Delta T^2} = 4\pi^2$$
$$= \frac{30 - 10}{1.2 - 0.4} = 25$$

$$g = 4\pi^2 \times 25 = 987.7 \text{ cm}^*/\text{sec}^2$$



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Experiment two

Name: Hook's law.

Aim: 1. Verification Hook's law.

2. Determination Hook's Constant (K).

3. Determination specific weight of solid material

٣- تحديد الوزن النوعي للمواد الصلبة.

Theory:-

Elasticity: is a property of material that allow to it to return to its shape and length after it distorted.

قابلية المادة لتسمح لها بالعودة إلى شكلها وطولها بعد تدميرها.

* Hook's law: Difference in length (ΔL) is directly proportional to the force affected it.

* important laws

$$① F \propto \Delta L$$



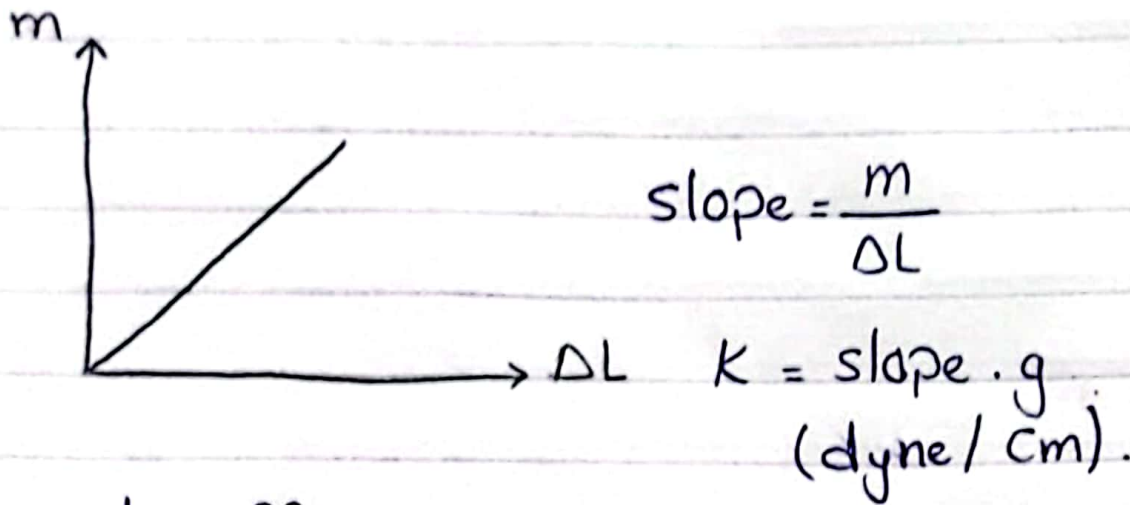
$$F = -K \Delta L.$$

$$② mg = -K \Delta L$$



$$K = \frac{m}{\Delta L} \cdot g$$

(14)



* $L_0 = ??$

الطول الطبيعي

$$m \propto \Delta L$$

$$\Delta L = L - L_0$$

* specific weight :- the weight of certain volume of material to the weight of the same volume of water.

$$S.W = \frac{W_a}{W_a - W_w}$$

$$= \frac{m_a g}{m g - m_w g} = \frac{m_a}{m_a - m_w}$$

$$S.W = \frac{\Delta L_a}{\Delta L_a - \Delta L_w}$$

$$L - L_0 \rightarrow$$

m (gram)	ΔL (cm)
10 g	0.5 cm
20 g	1 cm
30 g	1.5 cm
40 g	2 cm
50 g	2.5 cm

$$\text{slope} = \frac{\Delta m}{\Delta L} = \frac{45 - 25}{2.25 - 1.25} = 20 \text{ g/cm}$$

$$K = \text{slope} \cdot g$$

$$= 20 \cdot 980 = 19600 \text{ dyne/cm}$$

$$\Delta L_a = 7.5 - 4 = 3.5$$

$$\therefore m_a = 70$$

$$\Delta L_w = 7 - 4 = 3$$

$$m_w = 60$$

m (gm)

$$sw = \frac{\Delta l_a}{\Delta l_a - \Delta l_w} = \frac{3.5}{3.5 - 3} = 7$$

