

② =  $\frac{v}{c} \approx \frac{v}{3 \times 10^8}$

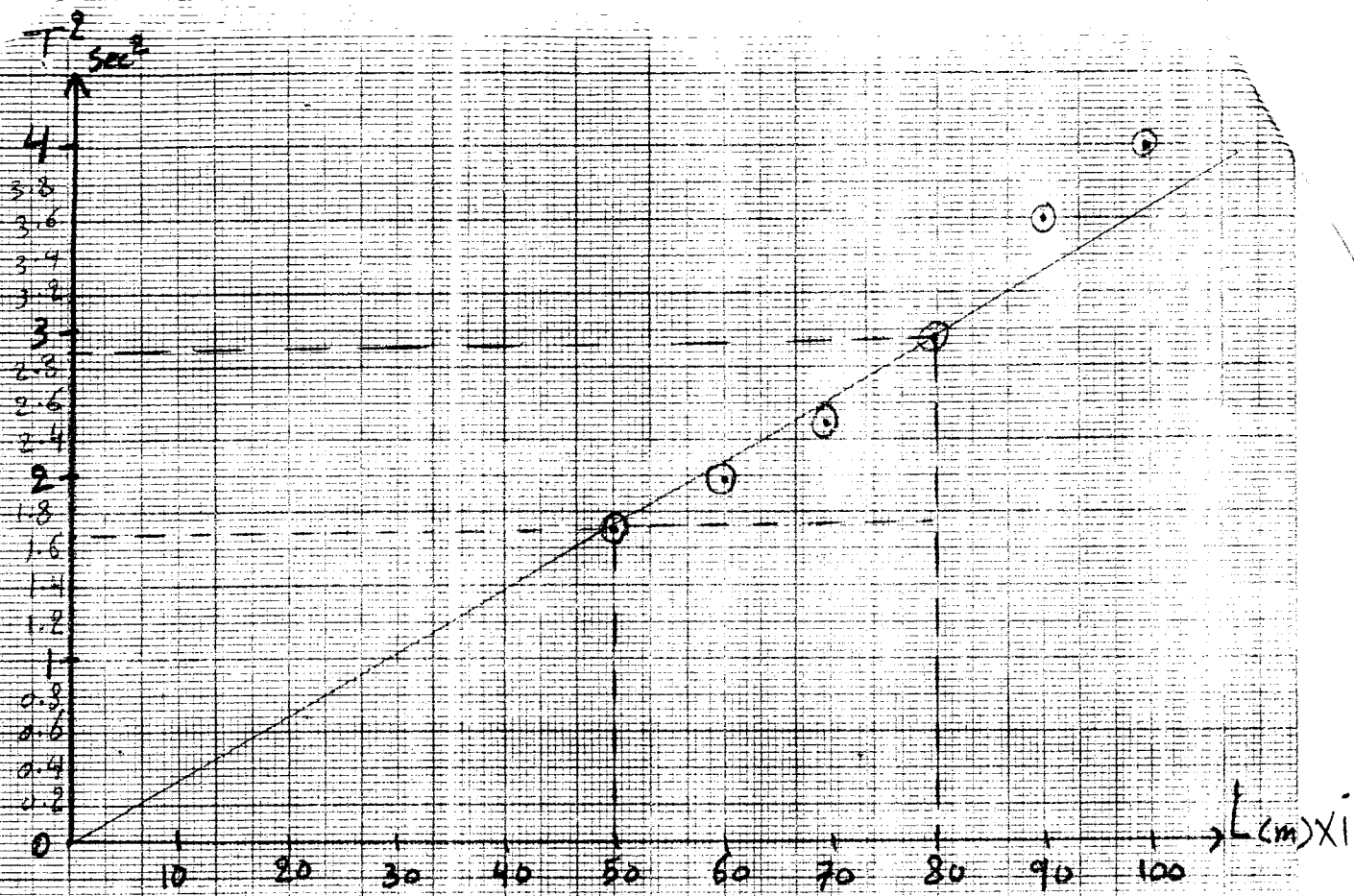
valued:  
 $T^2 \text{ sec}^2$

$= (l+r) \text{ cm} \quad t_{10} \text{ (sec)} \quad T = \frac{t_{10}}{10} \text{ (sec)}$

100	20	19.88	2		4
					3.61
90	19	18.82	1.9		2.89
80	17	17.34	1.7		2.56
70	16	16.25	1.6		1.96
60	14	14.81	1.4		1.69
50	13	13.53	1.3		

ملاحظة :- كل مرة نلف الحيط فيها 2 مرات نقيس من الطول الكلي للبدول (10 cm).

- 20 - 19.88 = 0.12
- 19 - 18.82 = 0.18
- 17 - 17.3 = 0.34
- 16 - 16.25 = 0.25
- 14 - 14.81 = 0.81
- 13 - 13.53 = 0.53



$$\begin{aligned} \text{slope} &= \frac{Y_2 - Y_1}{X_2 - X_1} \\ &= \frac{2.89 - 1.69}{(80 - 50) \times 10^{-2}} \\ &= \frac{1.2}{30 \times 10^{-2}} \end{aligned}$$

$$\text{slope} = 4 \left( \frac{\text{sec}^2}{\text{m}} \right)$$

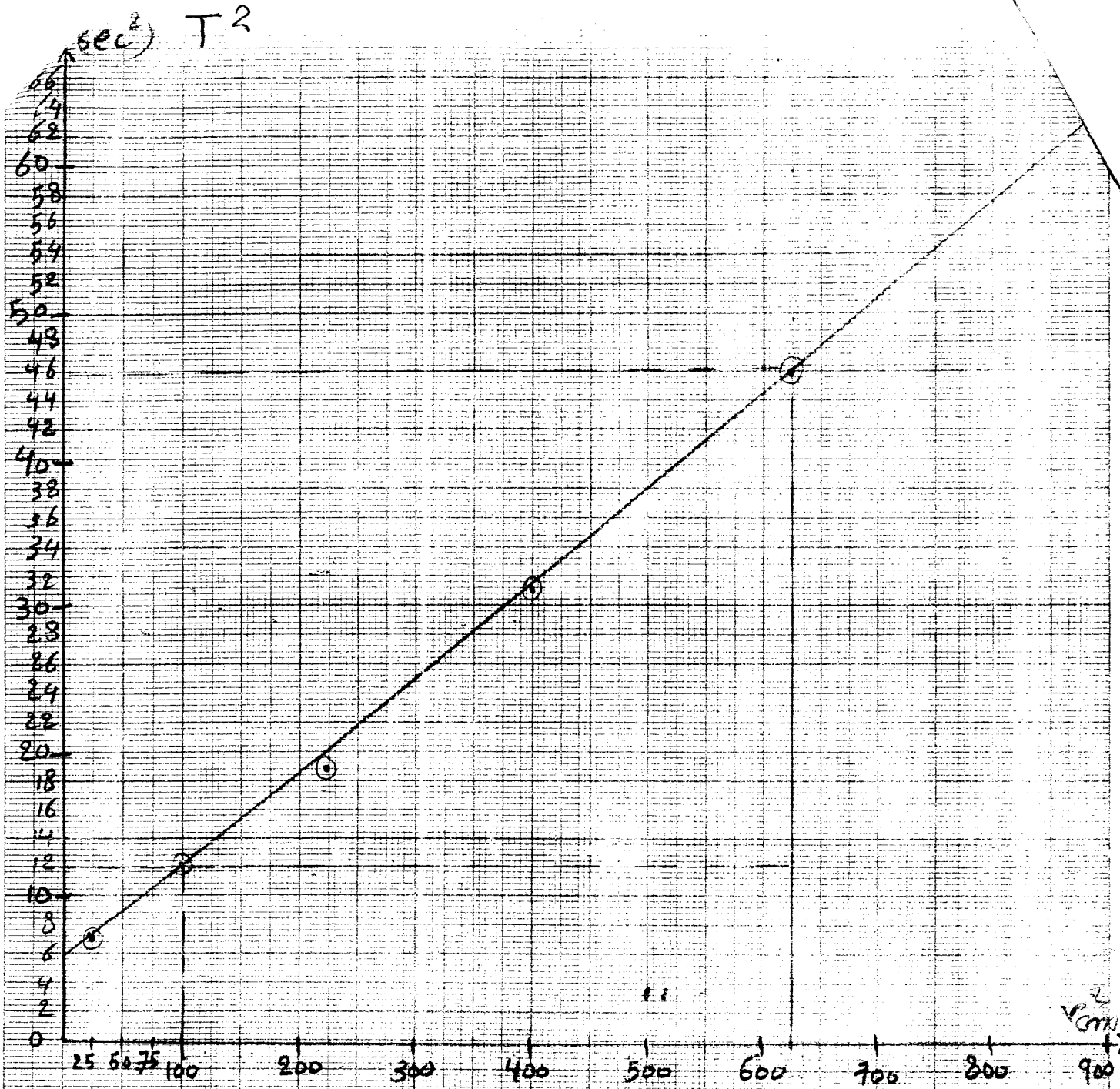
جواب

$$g = \frac{4\pi^2}{\text{slope}} = \frac{4 \times (3.14)^2}{4} = 9.8596 \left( \frac{\text{m}}{\text{sec}^2} \right)$$

5

$r$ (cm)	$t$ (sec)	$T = \frac{t}{5}$ (sec)	$T^2$ (sec <sup>2</sup> )	$r^2$ (cm <sup>2</sup> )
30	40 40	8	64	900
25	34 33	6.8	46.24	625
20	28 28	5.6	31.36	400
15	22 22	4.4	19.36	225
10	17 17	3.4	11.56	100
5	13 13	2.6	6.76	25

ملاحظة: مقدار الدارة هو 18.0



$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{46.24 - 11.56}{(625 - 100) \times 10^{-4}}$$

$$= \frac{34.68}{525 \times 10^{-4}}$$

$$\text{slope} = 0.0660571 \times 10^4 \quad \frac{\text{sec}^2}{\text{m}^2}$$

المساحة  $\frac{\text{m}^2}{\text{المساحة}}$

$$D = \frac{8 \text{ m } \pi^2}{\text{slope}} = \frac{8 \times 0.24 \times (3.14)^2}{0.0660571 \times 10^4} = \frac{18.930432}{660.57} = 0.0286 \text{ N.m}$$

$$\frac{F_1}{\sin \alpha} = \frac{F_2}{\sin \beta} = \frac{F_3}{\sin \gamma}$$

قانون کاسی  
قانون اکیبرٹ

$$\frac{1}{\sin 139} \approx \frac{1.3}{\sin 113} \approx \frac{1.4}{\sin 108}$$

$$\frac{1}{0.6560} \approx \frac{1.3}{0.9205} \approx \frac{1.4}{0.9510}$$

$$1.59 \approx 1.41 \approx 1.47$$

$$F_1 = \sqrt{F_2^2 + F_3^2 + 2F_2F_3 \cos \alpha} \quad \text{قانون اکیبرٹ تمام}$$

$$= \sqrt{(1.3)^2 + (1.4)^2 + 2 \times 1.3 \times 1.4 \cos 139}$$

$$= \sqrt{1.69 + 1.96 + 3.64 \cos 139}$$

$$= \sqrt{3.65} \quad 3.64 \times (-0.754)$$

$$= \sqrt{0.91} = 0.953 \text{ Nt}$$

$$F_2 = \sqrt{(1)^2 + (1.4)^2 + 2 \times 1 \times 1.4 \times \cos 113}$$

$$= \sqrt{2.96 + 2.8 \times \cos 113} \leftarrow (-0.390)$$

$$F_2 = \sqrt{1.868} = 1.366 \text{ Nt}$$

$$F_3 = \sqrt{(1)^2 + (1.3)^2 + 2 \times 1 \times 1.3 \times \cos 108}$$

$$F_3 = \sqrt{2.69 + 2.6 \cos 108} \rightarrow (-0.309)$$

$$= \sqrt{1.887} = 1.373 \text{ Nt}$$

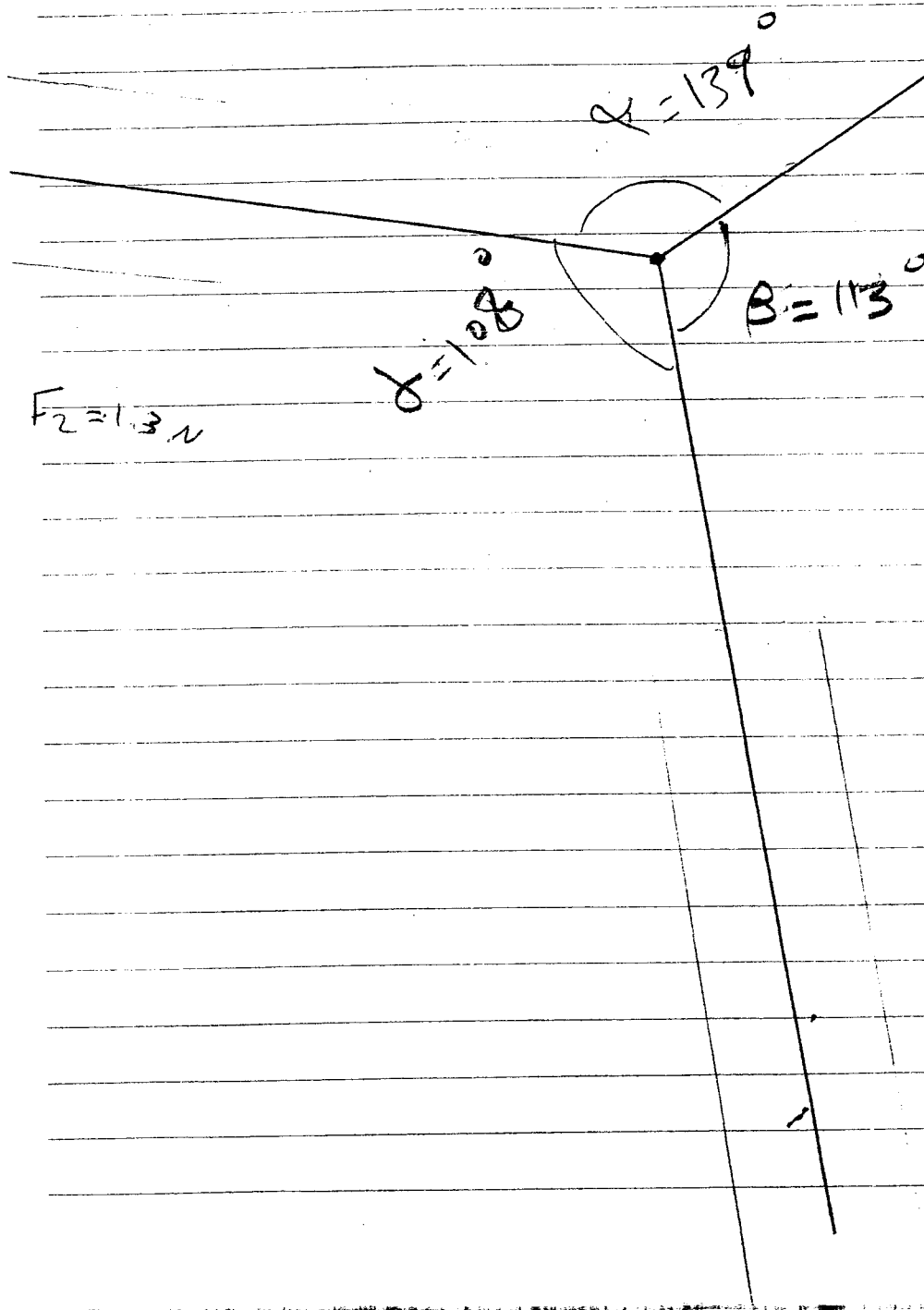
$$F_1 = \sqrt{F_2^2 + F_3^2 + 2F_2F_3 \cos \alpha}$$

$$\alpha + \beta + \gamma = 360^\circ$$

$$\{139^\circ + 113^\circ + 108^\circ = 360^\circ\}$$

$$\{F_1 = 1 \text{ Nt} ; F_2 = 1.3 \text{ Nt} ; F_3 = 1.4 \text{ Nt}\}$$

$F_3 = 1.4 \text{ N}$



دعامة لصلابة

$$R \text{ نقا الفجوة} = 7.5 \text{ cm} \quad (2\pi R = \text{المحيط})$$
$$r \text{ نقا القصب} = 2.26 \text{ mm}$$
$$L \text{ طول القصب} = 35 \text{ cm}$$

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$$r \text{ نصف الكرة} = 1.2 \text{ cm}$$

$$r = \frac{D}{2} \quad \text{نقا الكرة المصدرة}$$
$$L = l + r$$

③ نحين كثافة الماء

$$r = \text{نقا الكرة} = 1.5 \text{ cm}$$

④ عزم القصور الذاتي

$m$  كتلة القصب المصدرة لا نتاجها

$$m \text{ كتلة الاثقال الموضوعة} = 0.24 \text{ kg}$$

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عدد قسرات: ٥ قسرات

بطريقة الاستاتيكية



$m$ (kg)	$\theta_1$	$\theta_2$	$\theta_d = \theta_1 - \theta_2$
1	5	2	3
2	10	3	7
3	15	5	10
4	20	7	13
5	25	9	14

$$k = \frac{360 g R L}{\pi^2 r^4} \text{ slope}$$

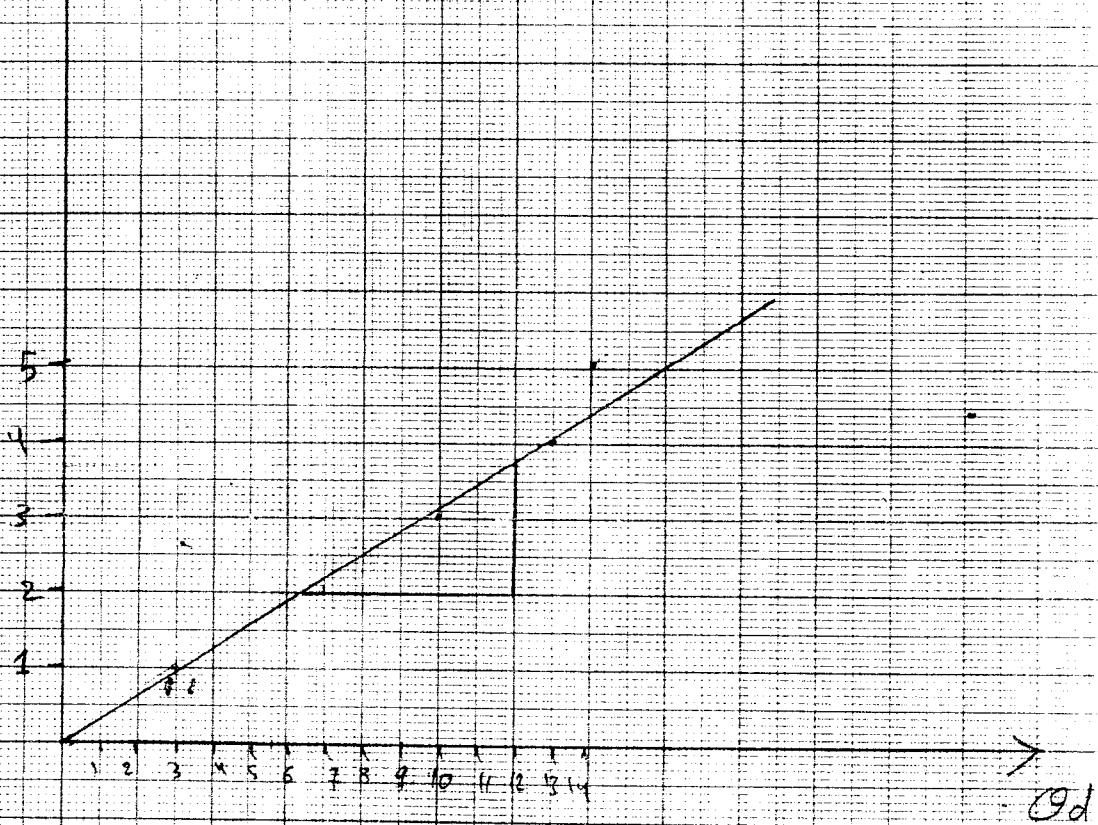
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7.5 cm = نصف القطر R  
 2.26 mm = نصف القطر r  
 35 cm = طول القصب L

$$\frac{\left( \text{kg} \frac{\text{m}}{\text{sec}^2} \right) \cdot \text{m} \cdot \text{m}}{\text{m}^4} = \text{N} / \text{m}^2$$



m (Kg)



$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3.7 - 2}{12 - 6.4} = \frac{1.7}{5.6} = 0.303$$

$$k = \frac{360 \text{ g RL}}{\pi^2 r^4} = \frac{360 \times 7.5 \times 10^{-2} \times 10 \times 35 \times 10^{-2}}{(3.14)^2 (2.26 \times 10^{-3})^4} \times 0.303$$

$$= \frac{9.8596}{26.0875 \times 10^{-12}}$$

$$= \frac{28,633.5 \times 10^{-4}}{9.8 \times 26.08 \times 10^{-12}}$$

$$= \frac{28,633.5 \times 10^{-4}}{255.65 \times 10^{-12}} = 112 \times 10^8$$

$$= 11.2 \times 10^7 \text{ N/m}$$

3)

$$(x_0 = 4)$$

القراءة الصغرى

m (gm)

x (cm)

d = x - x\_0 (cm)

5

5.5

1

1.5

10

5.5

2

15

6.5

3

20

7.5

3.4

25

7.5

4

30

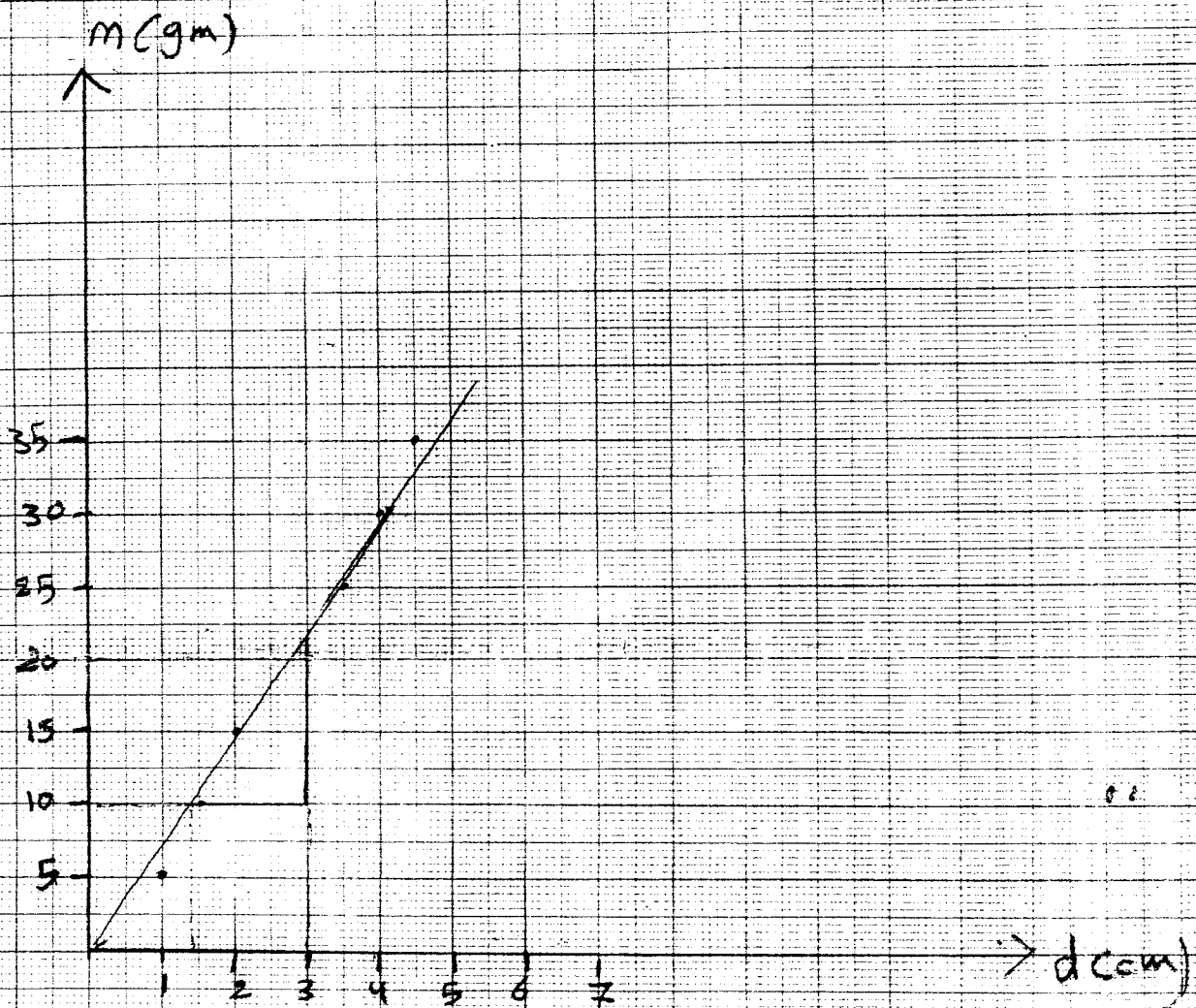
8

4.5

35

8.5

..



$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\rho = \frac{\text{slope}}{\pi r^2} = \frac{22 - 10}{3 - 1.4} = \frac{12}{1.6} = 7.5$$

$$\rho = \frac{(6.28 \times 7.5)}{(3.14) \times (1.5)^2} = \frac{7.5}{7.065} = 1.06 \text{ gm/cm}^3$$