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PHYSICS
MARKING SCHEME
PAPER 3

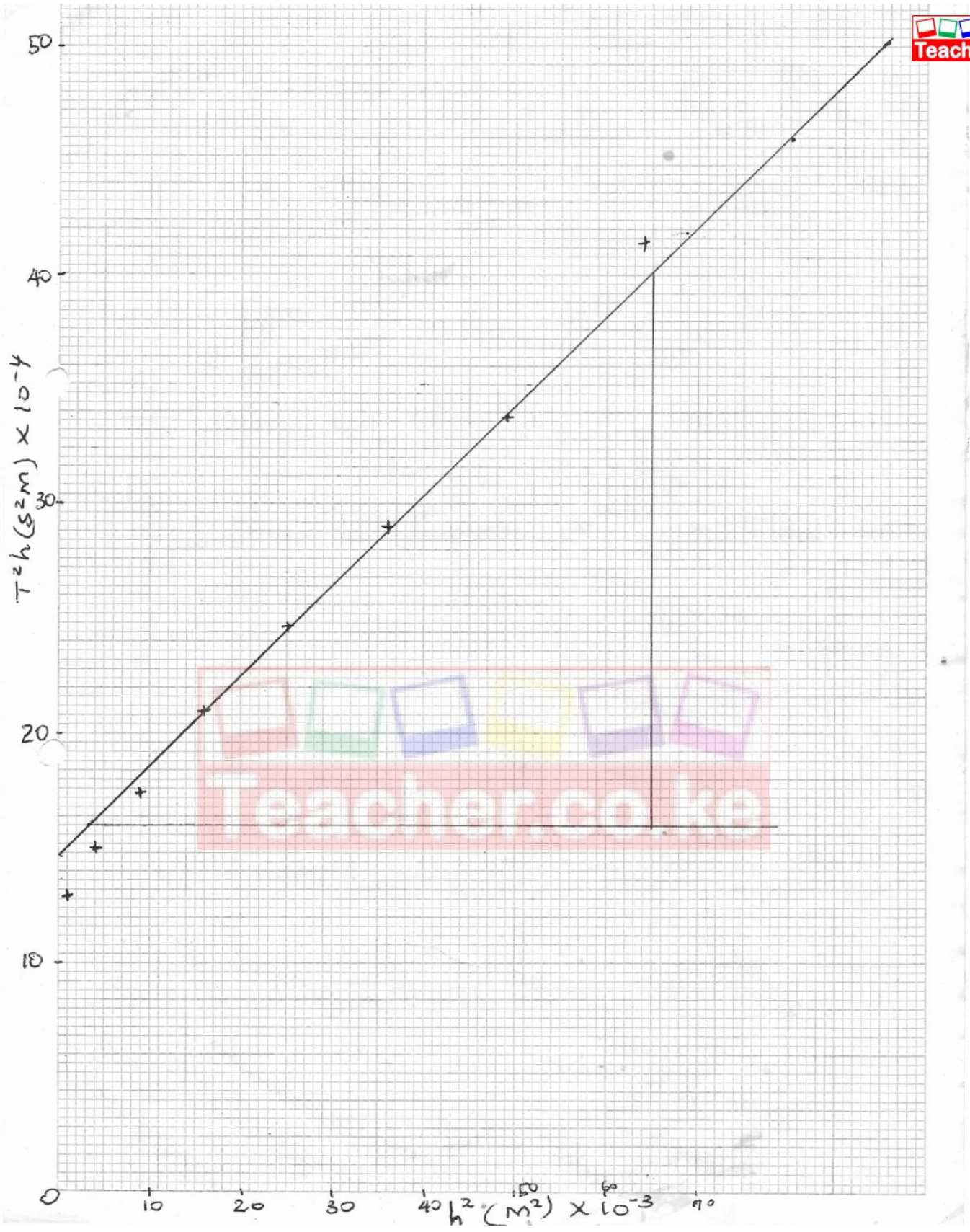
QUESTION 1

a) $r = 0.085 \pm 0.002$ m;✓1

h(m)	0.01	0.02	0.03.	0.04	0.05	0.06	0.07	0.08	✓1
Time t (s)	11.33	8.68	7.65	7.24	7.01	6.97	6.95	7.03	✓2
T (s)	1.133	0.868	0.765	0.724	0.701	0.697	0.695	0.03	✓ all
T2 (s)	1.284	0.753	0.585	0.524	0.491	0.486	0.483	0.494	✓ all
T^2 h (S^2m) x 10^{-3}	12.84	15.06	17.55	20.96	24.55	29.16	33.81	39.52	✓
h^2 (m^2) x 10^{-4}	1	4	9	16	25	36	49	64	✓

TOTAL 7

c) i) Scale ✓
Plotting (6 -7 Pts) ✓✓ (4 – 5 pts)✓
Line✓ Total 5
Axes (Labelled)✓



ii) Slope $= \Delta \frac{T^2 h}{h^2} = \frac{(40.0 - 16.0)\ x\ 10^{-3}}{65 - 3\ x10^{-4}}$

$= 3.871 \quad S^2 m^{-1}$ ✓1

d) $T2h = \frac{39.5 h^2}{p} + \frac{15}{100R}$

$\frac{39.5}{p}$;

i) Slope $= \frac{39.5}{p}$ ✓1

$4.033 = \frac{39.5}{p}$

$P = \frac{39.5}{3.871}$

$= 10.204\ m.5^{-2}$; ✓1

ii) y – intercept $= \frac{15}{100\ R}$ $14.6 \times 10^3 = \frac{15}{100 R}$

$14.6 \times 10^{-3} = \frac{15}{100} R\, x \frac{1}{14.6 x 10^{-3}}$

$= 10.274$ m5-2; ✓1

e) $G = \frac{10.204 + 10.274}{2}$

$= 10.239\ Ms^{-2}$;✓ Total 20

QUESTION 2

PART A

L (cm)	2.5	5.0	7.5	10	15	18	20	30	40	50
P.D V (Volts)	0.70	0.75	0.80	0.90	1.00	1.00	1.05	1.15	1.20	1.25
Current , I (A)	0.55	0.50	0.46	0.40	0.34	0.32	0.31	0.25	0.22	0.18
IV (Watt)	0.385	0.375	0.368	0.360	0.340	0.320	0.326	0.289	0264	0.225

Total (5mks)

ii) Scale✓ (5mks)

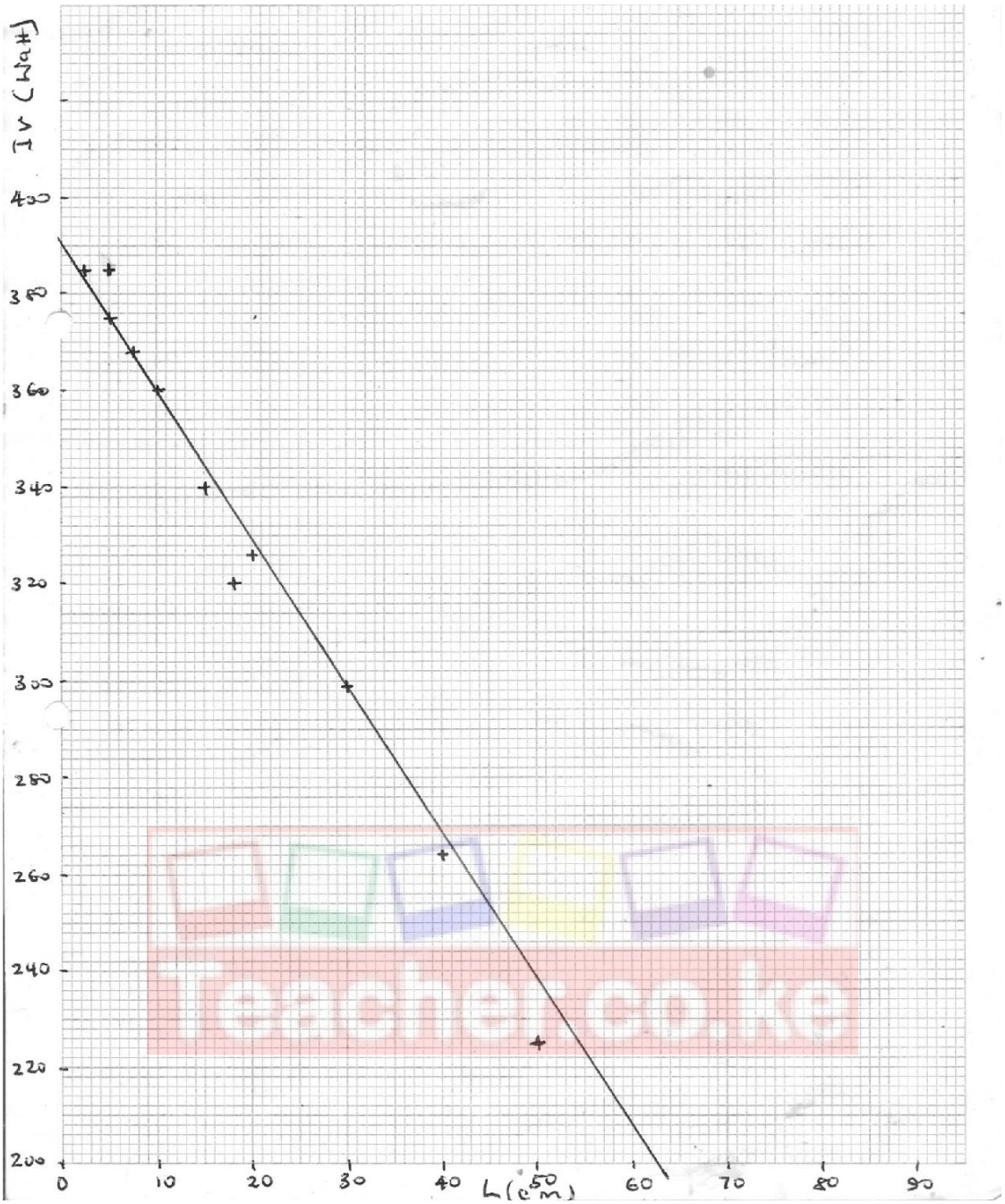
Plots✓

Line✓

Axes✓

a) i) $d = 0.35\ min = 3.5 \times 10^{-4}$ m

ii) $L^2 = 1.5\ V \pm$ Vol



iii) $L_0 = 63$ cm (students x – intercept Correctly read) (1mk)

c) i) $r = 1.30\sqrt{\ }$ ½ ✓

$I = 0.17\sqrt{\ }$ ½ ✓

ii) $r = \frac{E - r}{I}$

$= \frac{1.5-1.3}{0.17} = 1.176\,\Omega$ ✓ (1) (1 ± 0.2)

d) $e = \frac{\pi x 1.176\, x (3.5\, x 10^{-4})^2}{4\, x\, 0.63}$ ✓ (1) = $\frac{\pi r d^2}{4 L_0}$

= 1.796 x 10 Ωm ✓(1) 16 mks

QUESTION 2
PART B

Mi = $40^{\pm 1}\ cm$ (1mk)

OR MI = 0.40 ± 0.01m

Penalize ½ mk for lack of units.

e) Radius of curvature. (1mk)

f) $f = \frac{MI}{2}$

$= \frac{40}{4}$ (1mk)

= 20 cm ± 0.5 (1mk)