

EXPERIMENTAL TASK  
MARK SCHEME – TEST 1

Question	Marking details	Marks Available
(a)	$\ln A = -\lambda t + \ln A_0$ (1) Plot $\ln A$ (vertical axis) against $t$ (horizontal axis) or equivalent stated - accept a sketch showing this. NB. No back-crediting from candidate's graph. (1) [Remember to indicate in the box whether the information sheet has been given and not to award the marks if it has been issued].	2
(b)	Labelled diagram – springs shown approx vertical, securely attached vertical rule, weight shown on spring. (1) Method to avoid parallax [or shown on diagram]. (1) Suitable range of time intervals used which allows the amplitude to decrease by at least 50% and at least 5 equally spaced readings. (1) Justification of the choice of range provided by a statement in the method not just implied from results. (1) e.g. I plan to take these readings because they will show the amplitude decaying by at least half. Suitable initial amplitude, $A_0$ - minimum 10 cm. (1) [Remember to indicate in the box whether the information sheet has been given and not to award the marks if it has been issued].	5
(c)	Single clear main table: titles with units: including time, amplitude readings and $\ln A$ [ignore additional summary tables, e.g. a table with only $\ln A$ and $t$ columns]. (1) Resolutions correct ruler 1 mm (accept 0.5 mm), stopwatch 1 s. (1) $\ln A$ values correct. (1) Repeat readings and correct means. (1) All readings and means to resolution of instrument and $\ln A$ to 2 or 3 s.f. (1)	5
(d)	Axes labelled with units - correct orientation [e.c.f. from (a)]. (1) All points plotted correctly to within $\frac{1}{2}$ small square division. (1) Good line of best fit consistent with the data. (1) Suitable scales (not involving awkward factors, e.g. 3 / over $\frac{1}{2}$ each axis used). (1)	4
(e)	NB There is no mark for yes / no only – the marks are for the explanation, straight line / not a straight line. (1) Negative gradient [no e.c.f. on incorrect data]. (1) Points close to line of best fit or not [as appropriate]. (1)	3
(f)	(i) Large triangle used (should be close to extremities of the line of best fit) [or 2 equivalent suitable points clearly indicated on the graph] and gradient calculated. (1) $\lambda$ [identified as gradient] and given to 2 or 3 s.f. (1) Units $s^{-1}$ or $min^{-1}$ . (1)	3
	(ii) $\ln$ (original amplitude) or $\ln A_0$ [not $A_0$ on its own]. (1)	1
	(iii) Calculation of $\ln (A_0 / 2)$ given or horizontal line at $\ln (A_0 / 2)$ on graph shown. (1) Time calculated consistent with graph [NB No s.f. penalty]. (1)	2
		<b>[25]</b>

MARK SCHEME – TEST 2  
Same as TEST 1