Question Number	Answer	Additional guidance	Mark
3(a)	An answer that includes: (measure) mass of the trolley (1) (measure) (vertical) height / h (1) repeat for a range of masses (1) plus **any one** from: method of identifying / measuring h (1) OR repeat firing with same mass (1)	 weigh the trolley NOT measure height of ramp e.g. use of reference mark accept "use ruler to measure height/h" for 2 marks NOT "use ruler to measure height of ramp"	**(4)**

Question Number	Answer	Additional guidance	Mark
3(b)	reference to $\Delta PE = mg(\Delta)h$ (1) relevant values from graph and one calculation to find energy (1) repeated with 2nd set of values (1)	can be seen in calculations e.g. 0.6 x 10 x 0.230 ≈ 1.4 (J) e.g. 1.0 x (10) x 0.138 ≈ 1.4 (J) must see calculations for mp2 and 3	**(3)**

		1 mark for 2 calculations of mh with 'g' omitted (MP3)	
Question Number	**Answer**	**Additional guidance**	**Mark**
3(c)	A description including: measure appropriate distance (1) measure appropriate time (1) use (average) speed = $\frac{\text{distance}}{\text{time}}$ (1)	 e.g. distance along runway from max height to P e.g. start the watch when trolley stops stop the watch when trolley hits spring accept $s = \frac{d}{t}$	**(3)**

(Total for Question 3 = 9 marks)