Question Number	Scheme	Marks	Notes
4a	Correct use of *suvat* to give an equation in *h* only.	M1	Complete method – e.g. they may find the time (25/49) first
	e.g. $0 = 5^2 - 2gh$ or $5^2 = 0 - 2gh$	A1	Correct unsimplified equation in *h* only
	1.3 or 1.28 (m)	A1	2 or 3 sf No isw if they add 10.
		[3]	
4b	Use *suvat* to form an expression for the distance travelled by either particle in terms of *T* or *t*. e.g. $\pm(5T - \frac{1}{2}gT^2)$ Case 1 (*P*) $\pm\left[7(T-1) - \frac{1}{2}g(T-1)^2\right]$ Case 1 (Q) OR $\pm\left[5(t+1) - \frac{1}{2}g(t+1)^2\right]$ Case 2 (*P*) $\pm(7t - \frac{1}{2}gt^2)$ Case 2 (Q)	M1	For Case 1, allow consistent use of *t* for *T* For Case 2, penalise incorrect use of *T*
	Use *suvat* to form a correct expression, in terms of the same variable, for the distance travelled by the other particle	M1	N.B. M0M1 on ePEN is not possible.
	$10 + 5T - \frac{1}{2}gT^2 = 7(T-1) - \frac{1}{2}g(T-1)^2$ Or $10 + 5(t+1) - \frac{1}{2}g(t+1)^2 = 7t - \frac{1}{2}gt^2$	A1	Correct unsimplified equation in *T* or their *t*
	$(T =)$ 1.9 or 1.86	A1	2 or 3 sf
		[4]	
	ALT 1 Find position and velocity of *P* at *t* = 1: 10.1 m above ground, moving downwards at 4.8 m s^{-1} then: $\pm(4.8t + \frac{1}{2}gt^2)$ (*P*) M1 $\pm(7t - \frac{1}{2}gt^2)$ (Q) M1		

	$(4.8t+\frac{1}{2}gt^2)+(7t-\frac{1}{2}gt^2)=10.1$ **A1** $(T=)$ 1.9 or 1.86 **A1**		
	ALT 2 **Find position and velocity of Q at *t* = 0:** **11.9 m 'below' ground, moving upwards at 16.8** m s^{-1} **then:** $\pm(5T-\frac{1}{2}gT^2)$ **(*P*)** **M1** $\pm(16.8T-\frac{1}{2}gT^2)$ **(Q)** **M1** $16.8T-\frac{1}{2}gT^2-(5t-\frac{1}{2}gT^2)=21.9$ **A1**		
	$(T=)$ 1.9 or 1.86	**A1**	**2 or 3 sf**
4c	**e.g.** $v=-5+gT$ **or** $v=5-gT$	**M1**	**Complete method using *suvat* and their *T*** **M0 for** $v=5+gT$
	Speed of *P* = 13 or 13.2 $\left(\text{ms}^{-1}\right)$	**A1**	**2 or 3 sf** **Must be positive.**
		[2]	
		(9)	