Question Number	Scheme	Marks
7(a)	Whole system: $3000-1200g\sin\alpha-600g\sin\alpha-2R-R=1800(0.75)$	M1 A1 A1
	From exact working $R=60$ *	A1* cso
		(4)
7(b)	Trailer: $T-600g\sin\alpha-60=600(0.75)$ **OR** Car: $3000-1200g\sin\alpha-2(60)-T=1200(0.75)$ (T could be replaced by ($-T$) in either equation, leading to $T=-1000$, so tension is 1000)	M1 A1
	$T=1000(\text{N})$	A1
		(3)
7(c)	Equation of motion $-60-600g\sin\alpha=600a$ (or $-600a$) $\left[a=-\frac{11}{12}=-0.9166\ldots\right]$	M1 A1
	$0=12^2+2\left(-\frac{11}{12}\right)d$	M1
	$d=78.5,79$ (m)	A1
		(4)
		(11)
	Notes for question 7	
(a) **M1**	Equation of motion for the whole system (**or** for car AND trailer with T eliminated) to give an equation in R only. $\sin\alpha$ does not need to be substituted Correct number of terms, forces resolved where appropriate, condone sign errors and sin/cos confusion.	
A1	Correct equation with at most one error. $\sin\alpha$ does not need to be substituted	
A1	Correct equation. $\sin\alpha$ does not need to be substituted	
A1*	Reach the GIVEN answer with at least one intermediate line of working and must come from exact working.	
(b) **M1**	Equation of motion for the trailer or for the car. Correct number of terms, forces resolved where appropriate, condone sign errors and sin/cos confusion. $\sin\alpha$ does not need to be substituted but $R = 60$ does	
A1	Correct unsimplified equation. $\sin\alpha$ does not need to be substituted	
A1	Correct answer for T	
(c) **M1**	Form an equation of motion for the trailer to find the new acceleration. Correct number of terms, forces resolved where appropriate, condone sign errors and sin/cos confusion. $\sin\alpha$ does not need to be substituted but $R = 60$ does	
A1	Correct unsimplified equation. $\sin\alpha$ does not need to be substituted	
M1	Complete method, with a calculated acceleration that is not g, to find the distance travelled.	
A1	Cao 2 or 3sf Must be positive. **N.B.** Allow a negative value of d and made positive for the distance.	