Question Number	Scheme	Marks	Notes
4(i)	Equation of motion for the system	M1	All terms required. Dimensionally correct. Condone sign errors and sin/cos confusion
	$3050-300-2500g\sin\theta=2500a$	A1 A1	Unsimplified equation with at most one error. Correct unsimplified equation NB A sign error on the 300 or a sign error on $2500g\sin\theta$ counts as 2 errors (to be consistent with the penalty if they did this in 2 separate equations).
	$a=0.4$ (m s^{-2})	A1	Not $\frac{2}{5}$ (follows 9.8)
		(4)	
(ii)	Equation of motion for the truck	M1	All terms required. Dimensionally correct. Condone sign errors and sin/cos confusion
	$T-100-500g\sin\theta=500a$ $T=650$ (N)	A1 A1	Unsimplified equation with at most one error. Condone negative T Consistent sign for T. Correct unsimplified equation (in a or their a)
	$T=650$ (N)	A1	Must be positive
		(4)	
(ii) alt	Equation of motion for the engine	M1	All terms required. Dimensionally correct. Condone sign errors and sin/cos confusion
	$3050-200-2000g\sin\theta-T=2000a$ $T=650$ (N)	A1 A1	Unsimplified equation with at most one error. Condone negative T Correct unsimplified equation
	$T=650$ (N)	A1	Must be positive
		(4)	
			(i) and (ii) can be solved together by forming the two separate equations of motion and solving using simultaneous equations. M1A1A1 **for each equation** and A1A1 as above.
			If the 100 N and the 200 N are associated with the wrong vehicles, treat this as a MR. This error gives them $T = 750$
		(8)	