Q	Scheme	Mark	Notes
5a	Use of $P = Fv$	M1	$\frac{10000}{16}\left(=625\right)$ o.e. seen or implied in the working. Allow for $\frac{10}{16}$
	Equation of motion for the system	M1	Dimensionally correct. Need all terms and no extras. Condone sign errors and sine/cosine confusion If they start with separate equations for the van and trailer, just mark the combined equation.
	$F - 400 - 800g\sin\alpha = 800a$	A1 A1	Unsimplified equation in P or F with a most one error Correct unsimplified equation in P or F Use of cosine in place of sine for both vehicles counts as a repeated error and only loses 1 mark
	Obtain deceleration $0.419\left(\text{m s}^{-2}\right)$ or $0.42\left(\text{m s}^{-2}\right)$	A1	3 sf or 2 sf only Answer must be positive.
		[5]	
5b	Equation of motion for the van or the trailer	M1	Dimensionally correct. Need all terms and no extras. Condone sign errors and sine/cosine confusion Use the mass in the *ma* term to decide which part of the system they are using.
	$T - 150 - 200g\sin\alpha = 200a$ or $F - T - 250 - 600g\sin\alpha = 600a$	A1 A1	Unsimplified equation with at most one error Correct unsimplified equation
	Obtain tension $206\left(\text{N}\right)$ or $210\left(\text{N}\right)$	A1	3 sf or 2 sf only
		[4]	
		(9)	