Question Number	Solution	Marks	Notes
6a	$R = 6g\cos\alpha$	B1	Correct normal reaction
	Work done $= 15\times 0.25\times R$	M1	Correct method with their R
	$= 204\,(\text{J})$	A1	Or 200(J) Accept $21g$ or better. (20.7692...g) Not $\frac{2646}{13}$
		(3)	
6b	NB The question specifies that the work-energy principle should be used, so solutions based on *suvat* equations are not accepted.		
	Initial KE – GPE lost – WD = final KE	M1	Use of work-energy to form equation in v. Dimensionally correct. Ignore sign errors. Allow WD or their WD
	$\frac{1}{2}\times 6\times 14^2 - 6g\times 15\times\frac{5}{13} - 6g\times 15\times\frac{3}{13}$ $= \frac{1}{2}\times 6v^2$ $\left(3\times 196 - \frac{450g}{13} - \frac{270g}{13} = 3v^2\right)$	A1ft A1ft	Unsimplified equation with at most one error Correct unsimplified equation Follow their WD
	$v = 3.88 \quad (3.9)$	A1	Max 3 sf
	Work-energy equation	M1	Complete method using work-energy to form equation in w. Dimensionally correct. Ignore sign errors.
	$\frac{1}{2}\times 6\times 14^2 - 6g\times 15\times\frac{3}{13} = \frac{1}{2}\times 6w^2$ or $\frac{1}{2}mw^2 = \frac{1}{2}mv^2 + mg\times\frac{15\times 5}{13}$	A1ft	Correct unsimplified equation Follow their WD or their v
	$w = 11.3 \quad (11)$	A1	Max 3 sf
		(7)	
		[10]	