Q	Scheme	Mark	Notes
3a	$F_{\max} = \frac{1}{3} \times 2g\cos\alpha \left(= 5.90...\right)$	M1	Use of $F = \mu R$ Seen or implied. Condone sine / cosine confusion Condone g missing
	WD against friction $= 6 \times$ *their* $F_{\max}$	M1	$\left(= 35.4...(\text{J})\right)$ Seen or implied as part of the 4th M mark
	PE gain $= 2g \times 6 \times \sin\alpha$ $\left(= 6 \times \frac{42}{5} = 50.4\right)$	M1	dimensionally correct. Condone sine / cosine confusion
	Total WD = WD against friction + WD against gravity (gain in PE)	DM1	Dependent on the 3 preceding M marks. Require both terms and no extras
	Total WD $= 85.8\left(\text{J}\right)$ or $86\left(\text{J}\right)$	A1	3 sf or 2 sf only $\left(8\sqrt{10} + 36\right)\frac{g}{7}$ is A0 (incorrect units)
	NB a candidate who resolves parallel to the slope but never multiplies either component by 6 will score the first M1 only		
		[5]	
3b	Work-energy equation (KE gained = loss in GPE - WD against friction)	M1	Must be using work-energy. Need all terms, no extras and dimensionally correct. Condone sign errors Condone sine / cosine confusion.
	$\frac{1}{2} \times 2v^2 = 2g \times 6\sin\alpha - 6 \times \frac{2}{3} g\cos\alpha$	A1 A1	Unsimplified equation with at most one error Correct unsimplified equation. They must have started with correct expressions, but follow through on any calculation errors
	$v = 3.87\left(\text{m s}^{-1}\right)$ *or* $3.9\left(\text{m s}^{-1}\right)$	A1	3 sf or 2 sf only
		[4]	
		(9)	