16	(a)	Resolve down the plane	M1	3.1b	N2L with no other forces with	Allow sin/cos
		$2g\sin 20^\circ = 2a$			attempt to resolving the weight	interchange for M
		$a = g \sin 20^{\circ} [= 3.352]$	A1	3.3	Allow $a = -g \sin 20^\circ$ if it is clear	mark
					that up the slope is the positive	
					direction.	
		$s = \mu t + \frac{1}{2}at^2$ with $s = 0.7$, $\mu = 1.4$ and their a	M1	3.3	Heing and equation(a) loading to	
				0.0	an equation for t: allow sign errors	
		$0.7 = 1.4t + \frac{1}{2}(g\sin 20^\circ)t^2$			Correct equation using their $0.5a$	
			A1	3.4	Allow coefficient of t^2 1 7 or better	Solution BC is
		$(4.9\sin 20^\circ)t^2 + 1.4t - 0.7 = 0$				sufficient
			A1	3.2a	Cao Must select correct root if two	
		Time taken is 0.352 s	[5]		roots given	Allow if positive
1(D1	25		root only seen
10	(D)	Friction (and/or air resistance) would have the	BI [1]	3.5 a	Needs to indicate why ignoring	eg "friction will slow
		underestimates time	[1]		underestimate	It down for BI
16	(c)	$0.7 \qquad 1.4 \qquad 0.0 \qquad 0.7 \qquad 1.4 \qquad 0.0 \qquad 1 \qquad 0.0^2$	M1	33	Use of <i>supat</i> equation(s) to find <i>a</i> :	
10	(C)	$s = 0.7, u = 1.4, t = 0.8 \Longrightarrow 0.7 = 1.4 \times 0.8 + \frac{1}{2}a \times 0.8^{-1}$		0.0	allow sign errors	
		$a = \frac{0.7 - 1.12}{0.12} = -1.3125$ (-1.31 to 3 sf)	A1	1.1b	Allow $a = 1.3125$ if sign	eg both <i>u</i> and <i>s</i>
		u = 0.32 = 1.5125 (1.51 to 5 sr)	[2]		convention clear	negative
16	(d)	N2L down the plane	M1	3.1b	All forces present and weight	Notice R may be
					resolved; allow sin/cos interchange	found first. Allow
		$2g\sin 20^\circ - F = 2 \times (-1.3125)$	A1	1.1b	Fully correct equation; F need not	sin/cos interchange
		(F = 9.32859)			be evaluated here	in <i>their</i> first equation
		Resolve perpendicular to the plane	M1	33	No extra forces	equation must be
		$R = 2g\cos 20^\circ$	A1	1 1h	Fully correct equation: R need not	consistent to award
		(R = 18.4)	111	1.10	be evaluated here	M1
		Use of $F = \mu R$	M1	3.4	Allow for their <i>F</i> and <i>R</i> used	
		$u = \frac{9.32859}{0.506} = 0.506$ (3sf)		1 11		
		$\mu - \frac{18.4}{18.4} = 0.500 (351)$	Al	1.1b	Accept 0.506 or 0.507 Must be 3st	
			[0]			