Question	Scheme	Marks	AOs
<b>4</b> (a)	Moments about A (or any other complete method)	M1	3.3
	$T\cos 30^{\circ} \ge (1\sin 30^{\circ}) = 20g \ge 1.5$	A1	1.1.b
	$T\cos 30^{\circ} \ge (1\sin 30^{\circ}) = 20g \ge 1.5$	A1	1.1.b
	T = 679 or $680$ (N)	A1	1.1.b
		(4)	
(b)	Resolve horizontally	M1	3.1b
	$X = T \cos 60^{\circ}$	A1	1.1b
	Resolve vertically	M1	3.1b
	$Y = T\cos 30^\circ - 20g$	A1	1.1b
	Use of $\tan q = \frac{Y}{X}$ and sub for T	M1	3.4
	49° (or better), below horizontal, away from wall	A1	2.2a
		(6)	
(c)	Tension would increase as you move from $D$ to $C$	B1	3.5a
	Since each point of the rope has to support the length of rope below it	B1	2.4
		(2)	
( <b>d</b> )	Take moments about $G$ , $1.5Y = 0$	M1	3.3
	Y = 0 hence force acts horizontally.*	A1*	2.2a
		(2)	
(14 marks)			
Notes:			
<ul> <li>(a)</li> <li>M1: Correct</li> <li>A1: (A1A0</li> <li>A1: (A0A0</li> <li>A1: Either</li> </ul>	et overall strategy e.g. $M(A)$ , with usual rules, to give equation in <i>T</i> only one error) Condone 1 error two or more errors) 679 or 680 (since $g = 9.8$ used)		
<ul> <li>(b)</li> <li>M1: Using an appropriate strategy to set up first of two equations, with usual rules applying e.g. Resolve horiz. or M(<i>C</i>)</li> <li>A1: Correct equation in <i>X</i> only</li> <li>M1: Using an appropriate strategy to set up second of two equations, with usual rules applying e.g. Resolve vert. or M(<i>D</i>)</li> <li>A1: Correct equation in <i>Y</i> only</li> </ul>			

**M1:** Using the model and their *X* and *Y* 

A1: 49 or better (since g cancels) Need all three bits of answer to score this mark or any other appropriate angle e.g  $41^{\circ}$  to wall, downwards and away from wall

(c)

B1: Appropriate equivalent commentB1: Appropriate equivalent reason

(**d**)

M1: Using the model and any other complete method e.g. the three force condition for equilibrium A1\*: Correct conclusion GIVEN ANSWER