

Question		Answer	Marks	AO	Guidance	
11	(b)		M1*	3.3	Attempt at resolving vertically or horizontally – correct number of terms with the contact force at <i>B</i> resolved (angle must be one of 25, 35, 55 or 65 only) – or taking moments again (see below) (same conditions for taking moments as in part (a)). M0 if using <i>W</i> or <i>mg</i> only for the weight of the rod (must substitute in the given value before awarding this mark – see second guidance column if using <i>20g</i>)	Allow sign errors, sin/cos confusion and <i>20g</i> used as the weight for the M mark. Allow R_B instead of the given value of 9.56 for the M mark
		$R_A + 9.56 \sin 35 = 20$ $F_A = 9.56 \cos 35$	A1 A1	1.1 1.1	Correct expression/equation for R_A Correct expression/equation for F_A	$R_A = 20 - 5.48... = 14.5...$ $F_A = 7.83...$
		$\sqrt{(9.56 \cos 35)^2 + (20 - 9.56 \sin 35)^2}$	M1dep*	1.1	Correct method for calculating the magnitude of the contact force at A where R_A and F_A are a linear combination of the correct number of terms with 9.56 resolved in both equations (angle must be one of 25, 35, 55 or 65 only)	
		16.5 (N)	A1	2.2a	www awrt 16.5. For reference if using 9.56 for R_B then 16.494179...	If using more accurate value for R_B then 16.494698...
			[5]			

Question		Answer	Marks	AO	Guidance	
For reference in parts (a) and (b) :						
Moments about B : $R_A(2.8\cos 30) = F_A(2.8\sin 30) + 20(1.4\cos 30)$						
Moments about the mid-point: $R_A(1.4\cos 30) = F_A(1.4\sin 30) + R_B(1.4\cos 25)$						