

Question Number	Scheme	Marks
4(a)	$2T \sin \beta = 3mg$ OR $\frac{T}{\sin(90^\circ - \beta)} = \frac{3mg}{\sin 2\beta}$	M1
	$T = \frac{3mg}{2 \sin \beta}$ OR $T = \frac{3mg \cos \beta}{\sin 2\beta}$	A1
		(2)
(b)	For A or B: $(\uparrow) R = mg + T \sin \beta$ OR For whole system: $(\uparrow) 2R = 3mg + mg + mg$ OR For AC or BC: $(\uparrow) R + T \sin \beta = mg + 3mg$	M1 A1
	$R = 2.5mg$	A1
		(3)
(c)	$F = T \cos \beta$	M1A1
	$F = \frac{4}{5} \times 2.5mg$	B1 ft
	Eliminate T and solve for $\tan \beta$	M1
	$\tan \beta = \frac{3}{4}$	A1
		(5)
		(10)
	Notes for question 4	
4(a)	M1 Resolve vertically for C with usual rules or use triangle of forces	
	A1 Answer. Allow $\cos(90^\circ - \beta)$ for $\sin \beta$ or $\sin(90^\circ - \beta)$ for $\cos \beta$	
4(b)	M1 Resolve vertically for A or B , for whole system or for AC or BC with usual rules	
	A1 Correct equation	
	A1 Correct answer	
4(c)	M1 Resolve horizontally for A with usual rules	
	A1 Correct equation	
	B1 ft for $F = \frac{4}{5} \times$ their R (allow magnitude if $R < 0$) seen anywhere (B0 for just $F = 4/5 R$)	
	M1 Eliminate T and solve for $\tan \beta$ correctly.	
	A1 $\frac{3}{4}$ oe	