Question Number	Scheme	Marks
8(a)	$R = mg; F = 0.5R$	B1; B1
	For Q: $4mg - T = 4ma$	M1 A1
	For P: $T - F = ma$	M1 A1
	(whole system: $4mg - F = 5ma$)	
	Eliminate a and solve for T	**d**M1
	$T = 1.2mg$	A1
		(8)
8(b)	$v^2 = 2 \times 0.7gh \Rightarrow v = \sqrt{1.4gh}$ *	M1 A1*
		(2)
8(c)	$\pm 0.5mg = ma' \Rightarrow a' = \pm\ 0.5g$	M1 A1
	$0^2 = 1.4gh - 2 \times 0.5g \times d$	M1 A1
	$d = 1.4h$	A1
	Hence, length of string is greater than $1.4h + h = 2.4h$ *	A1 *
		(6)
		16
	Notes	
(a)		
B1	$R = mg$ seen (on a diagram possibly) seen or implied	
B1	$F = 0.5R$ seen (on a diagram possibly) seen or implied	
	N.B. Both B marks can be implied by $0.5mg$ appearing in an equation.	
M1	Equation of motion for Q, with all terms, condone sign errors.	
A1	Correct equation.	
M1	Equation of motion for P, with all terms, condone sign errors.	
A1	Correct equation.	
	N.B. Condone use of $4mg - F = 5ma$ for either equation Allow $-a$ instead of a in both equations	
dM1	Eliminate a and solve for T, dependent on both M marks.	
A1	Accept any equivalent	
	N.B. If they have different tensions, can score Max B1B1M1A1M1A0 dM0A0	
(b)		
M1	Complete method to obtain an equation in v and h using their a (not g) from part (a).	
A1*	Given answer correctly obtained. **N.B.** Must have '$v =$'	
(c)		
M1	Equation of motion with correct terms.	
A1	Correct equation	
M1	Complete method to obtain an equation in d and h **ONLY**, condone sign errors.	

	N.B. Must have found a new acceleration from a new equation of motion. **N.B.** M0 if using their a from part (a).	
A1	Correct equation	
A1	Correct d in terms of h	
A1*	Given answer correctly obtained – their answer must reflect the inequality	