

Question			Answer	Marks	AO	Guidance	
11	(a)		Car: $s = 2t^2$ Motorcycle: $s = 16(t - 1.5)$ $2t^2 = 16(t - 1.5)$ $t^2 - 8t + 12 = 0 \Rightarrow t = \dots$ $t_1 = 2$ and $t_2 = 6$	M1* A1 A1 M1dep* M1 A1 [6]	3.3 1.1 1.1 3.1a 1.1 1.1	Attempts motion for the motorcycle in terms of t with $a = 0$ – allow $s = 16t$ for this mark or attempts motion of the car with $u = 0$ Equates their expressions for s to obtain a three-term quadratic in t Attempts to solve their three-term quadratic in t	Dependent on all previous M marks Must obtain two positive values for t
11	(b)		The motorcycle is ahead of the car	B1 [1]	3.2a		
11	(c)		Maximum distance is at $t = 4$ $f(4) = 16(4) - 24 - 2(4)^2$ $= 8 \text{ m}$	B1ft M1 A1 [3]	3.1b 3.4 1.1	Follow through their positive values of t Method for finding maximum distance between the car and motorcycle	Or from differentiating $f(t) = 16t - 24 - 2t^2$