

Question			Answer	Marks	AO	Guidance	
7	(a)		DR				
			$\frac{dx}{dt} = 3t^2 + 2t$, $\frac{dy}{dt} = 2t + 2$, $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$	M1	1.1a	Attempt to find $\frac{dy}{dx}$	Correctly combine attempts at algebraic or numerical derivatives
			$\frac{dy}{dx} = \frac{2t + 2}{3t^2 + 2t}$	A1	2.1	Correct $\frac{dy}{dx}$	Algebraic or numerical (ie $\frac{4}{5}$) www
			$t = 1$	B1	3.1a	Correct t stated or explicitly used	Ignore any additional t values
			$y - 3 = \frac{4}{5}(x - 2)$	M1	1.1	Attempt equation of tangent, using (2, 3) and their numerical gradient (from clearly using their t value in their attempt at parametric differentiation)	If using $y = mx + c$ then M1 is awarded when value for c is obtained M0 if using $x = 3, y = 2$
			$5y = 4x + 7$ AG	A1 [5]	2.1	Obtain given answer www If trying to start with a Cartesian equation there are a number of different, correct, solutions. To gain any credit it would have to be a valid attempt in obtaining the initial equation, condoning only a slip. Please consult with your TL if seen.	

Question			Answer	Marks	AO	Guidance	
7	(b)		DR $5(t^2 + 2t) = 4(t^3 + t^2) + 7$ $4t^3 - t^2 - 10t + 7 (= 0)$ $(t - 1)(t - 1)(4t + 7)$ $t = -\frac{7}{4}$ $\left(-\frac{147}{64}, -\frac{7}{16}\right) \text{ oe}$	M1* A1 M1dep* A1 [4]	3.1a 2.1 3.1a 2.1	Attempt to solve equations of tangent and curve simultaneously Obtain correct cubic Brackets expanded and like terms collected Attempt to solve cubic to obtain t value other than $t = 1$ DR so method needed Obtain correct coordinates, in exact form, www See comment in part (a) with regard to using Cartesian equation	Or valid attempt to obtain an equation in x or y only Some (usually BC) methods may not explicitly state simplified cubic; if M1 awarded and $t = -\frac{7}{4}$ seen www then allow first A1 BOD, with then possibly SCB1 Factorise to 3 linear factors and solve oe, eg using division If using $(t - 1)^2$ as repeated factor, M1 for $(t - 1)^2 (4t \pm 7)$ If using $(t - 1)$ as linear factor then need both attempt at quadratic factor (factorisation or division) and also attempt to solve quadratic – BOD for slips Ignore (2, 3) if also given, but A0 if other point(s) as well If M1 A1 awarded for correct cubic, but no method shown to solve either cubic, or quadratic from $(t - 1)$(quadratic factor), then SC B1 for correct coordinates www ie max of 3 marks