Question Number	Scheme	Marks
5(a)		
M1	Divide through by y No need to re-arrange the equation until later	
M1	Attempt the differentiation using product rule and chain rule and obtain $\frac{d^3y}{dx^3} = \cdots$	
A1A1	A1 Either RHS term correct A1 Second RHS term correct and no extras	
A1*	Eliminate $\frac{d^2y}{dx^2}$ and obtain the **given** result	
ALT		
M1	Re-arrange the equation (Will probably be seen later in work)	
M1	Attempt the differentiation using product rule and chain rule	
A1A1	A1 Two terms correct A1 All correct and no extras	
A1*	Eliminate $\frac{d^2y}{dx^2}$ and obtain the correct result	
5(b)B1	Correct value for $\frac{d^2y}{dx^2}$	
M1	Use the *given* expression from (a) to obtain a value for $\frac{d^3y}{dx^3}$ Award if correct value seen.	
M1	Taylor's series formed using their values for the derivatives (2! or 2, 3! or 6)	
A1	Correct series, must start (or end) $y =$... Correct terms must be seen, order may be different. Can have f(x) = ... provided f(x) = y is defined somewhere.	

Question Number	Scheme	Marks
5		
NB	Question states "Use algebra..." so purely graphical solutions (using calculator?) score 0/7. A sketch and some algebra to find intersection points can score.	
	$2x^2+x-3\geq 0$	
	$2x^2+x-3=3(1-x)\Rightarrow 2x^2+4x-6=0$	M1
	$2x^2+4x-6\Rightarrow x^2+2x-3=(x+3)(x-1)=0$	
	$x=-3,\ 1$	A1
	$2x^2+x-3\leq 0$	
	$-2x^2-x+3=3(1-x)\Rightarrow 2x^2-2x=0$	M1
	$2x(x-1)=0,\ \ x=0,\ 1$	A1
	$x<-3 \quad 0<x<1 \quad x>1$	dM1A1A1 [7]
	The first 4 marks can be awarded with any inequality sign or =	
M1	Assume $2x^2+x-3\geq 0$ and obtain a 3TQ	
A1	Correct CVs obtained from a correct equation.	
M1	Assume $2x^2+x-3\leq 0$ and obtain a 2 or 3TQ	
A1	Correct CVs obtained from a correct equation.	
dM1	Form 3 distinct inequalities with their 3 CVs. Can have $<$ or $\leq$, $>$ or $\geq$. Must have scored both previous M marks. Accept $x<-3 \quad 0<x \quad x\neq 1$	
A1	All 3 correct CVs used correctly	
A1	Inequalities fully correct. "and" between the inequalities is acceptable. If $\cap$ is used, award A0 here. Fully correct set language accepted.	
ALT	*Squaring both sides*	
	$(2x^2+x-3)^2>9(1-x)^2$	
	$4x^4+4x^3-20x^2+12x>0$	M1A1
	$x(x+3)(x-1)(x-1)>0$	M1
	CVs: $x=0,-3,1$	A1
	Then as main scheme	
	These 4 marks can be awarded with any inequality sign or =	
M1	Square both sides and collect terms to obtain a quartic with 4 or 5 terms	
A1	Correct quartic	
M1	Factorise their quartic	
A1	3 correct CVs	