Question Number	Scheme	Marks
1(a)	$\frac{d^3y}{dx^3}+3\frac{dy}{dx}+3x\frac{d^2y}{dx^2}=-2\sin x$	M1M1
	$\frac{d^3y}{dx^3}=-2\sin x-3\frac{dy}{dx}-3x\frac{d^2y}{dx^2}$	A1 (3)
(b)	$\frac{d^3y}{dx^3}=-3\times5=-15$	B1 (1)
(c)	$\frac{d^2y}{dx^2}=-3\times0\times5+2=2$	B1
	$y=2+5x+x^2-\frac{5}{2}x^3$	M1A1 (3)
		[7]

(a)	Accept the dashed notation throughout this question.
M1	Differentiate $3x\frac{dy}{dx}$ with respect to x. The product rule must be used for $x\frac{dy}{dx}$ with at least one term correct
M1	Differentiate $\frac{d^2y}{dx^2}$ and $2\cos x$. $\frac{d^2y}{dx^2}\rightarrow\frac{d^3y}{dx^3}$ $\quad 2\cos x\rightarrow\pm2\sin x$
A1	$\frac{d^3y}{dx^3}=-3\left(x\frac{d^2y}{dx^2}+\frac{dy}{dx}\right)-2\sin x$. Give A0 if not rearranged to have $\frac{d^3y}{dx^3}=...$
(b)	
B1	$\frac{d^3y}{dx^3}=-15$ provided 3 terms in result in (a)
(c)	
B1	$\frac{d^2y}{dx^2}=2$ can be implied by a correct x^2 term in the expansion
M1	Use of a correct Taylor expansion with their values for $\frac{d^3y}{dx^3}$ and $\frac{d^2y}{dx^2}$ 2! or 2, 3! or 6·
A1	$y=2+5x+x^2-\frac{5}{2}x^3$ Must include y = ... or f(x) = .. provided f(x) has been defined to be y somewhere in the work.