Question number	Scheme	Marks
4	When $x=\dfrac{\pi}{2}$ $y=\dfrac{\pi^3}{8}$ So $\left(\dfrac{\pi}{2},\dfrac{\pi^3}{8}\right)$	B1
	$\dfrac{\mathrm{d}y}{\mathrm{d}x}=3x^2\sin x+x^3\cos x$	M1 A1 A1
	When $x=\dfrac{\pi}{2}$ $\dfrac{\mathrm{d}y}{\mathrm{d}x}=3\left(\dfrac{\pi}{2}\right)^2\sin\left(\dfrac{\pi}{2}\right)+\left(\dfrac{\pi}{2}\right)^3\cos\left(\dfrac{\pi}{2}\right)=\left[\text{'}\dfrac{3\pi^2}{4}\text{'}\right]$	M1
	$y-\dfrac{\pi^3}{8}=\dfrac{3\pi^2}{4}\left(x-\dfrac{\pi}{2}\right)$	M1
	$y=\dfrac{3}{4}\pi^2x-\dfrac{1}{4}\pi^3$	A1
		Total 7 marks

Mark	Notes
Note: In this question, all substitution of angle values must be in Radians only.	
B1	For obtaining $y=\frac{\pi^3}{8}$ [allow $\left(\frac{\pi}{2}\right)^3$ and also awrt $y=3.88$]
M1	For an attempt to use the product rule. The definition of an attempt is as follows: • There must be a correct attempt to differentiate both terms. $\sin x \Rightarrow \cos x \quad x^3 \Rightarrow ax^2$ where $x \neq 0$ • The correct formula must be used. i.e., it must be a sum of their two terms.
A1	At least one term must be correct. Either $3x^2\sin x$ or $x^3\cos x$
A1	For $3x^2\sin x + x^3\cos x$ oe Ignore any subsequent simplification once you have seen the correct answer – even if the simplification is incorrect.
M1	For substitution of $\frac{\pi}{2}$ into their $\frac{\mathrm{d}y}{\mathrm{d}x}=\left['\frac{3}{4}\pi^2'\right]$ provided it is a changed expression. Allow a value of awrt 7.4(0) **NOTE:** You must see a full substitution of $\frac{\pi}{2}$ into their $\frac{\mathrm{d}y}{\mathrm{d}x}$ if their expression for $\frac{\mathrm{d}y}{\mathrm{d}x}$ is incorrect.
M1	For a correct method for finding the equation of a line using their value of y, dy/dx and the given x [allow $x = 1.57\ldots$]. This must be applied correctly. Either uses the formula with their values, or if uses $y=mx+c$ they must reach a value for c before this mark can be awarded. Do **not** allow processing errors to find the value of c
A1	For $y=\frac{3}{4}\pi^2x-\frac{1}{4}\pi^3$ Allow $y=7.4(0)x-7.75$ or better values. Do not allow a mixture of decimals and exact values.