Question number	Scheme	Marks
10 (a)	$\int\left(3x^2-4x-p\right)\,\mathrm{d}x=\frac{3x^3}{3}-\frac{4x^2}{2}-px+c\quad\left[=x^3-2x^2-px+c\right]$	M1A1
	$y=x^3-2x^2-px+c$	
	At $(2,0)$ $\quad 0=8-8-2p+c\Rightarrow c=2p$	M1
	At $(-1,9)$ $\quad 9=-1-2+p+c\Rightarrow c=12-p$	M1
	$\Rightarrow p=4, c=8\Rightarrow y=x^3-2x^2-4x+8$ *	A1A1cso [6]
(b)	$x^3-2x^2-4x+8=8-4x\Rightarrow x^3-2x^2=0\Rightarrow x^2\left(x-2\right)=0$	M1
	$x=0, x=2$	A1
	Area $=\int_0^2\left(8-4x\right)\,\mathrm{d}x-\int_0^2\left(x^3-2x^2-4x+8\right)\,\mathrm{d}x$	M1
	Area $=\int_0^2\left(8-4x\right)\,\mathrm{d}x-\int_0^2\left(x^3-2x^2-4x+8\right)\,\mathrm{d}x=\int_0^2\left(-x^3+2x^2\right)\,\mathrm{d}x$	
	Area $=\left[-\frac{x^4}{4}+\frac{2x^3}{3}\right]_0^2=\left(-4+\frac{16}{3}\right)-(0)=\frac{4}{3}$	M1M1A1 [6]
		Total 12 marks

(a)	
M1	Attempts to integrate
A1	Correct integration including + c
M1	Substitution of (2, 0) (Does not have to be simplified)
M1	Substitution of (–1, 9 (Does not have to be simplified)
A1	$p=4, c=8$
A1 cso	Obtains the **given** answer with no errors in the working
(b)	
M1	Equating C and l
A1	$x=0$ and $x=2$ **NB** If correct limits are seen then M1A1 is awarded
M1	Use of $\int_a^b\left(\mathrm{f}(x)-\mathrm{g}(x)\right)\mathrm{d}x$ or $\int_a^b\mathrm{f}(x)\mathrm{d}x-\int_a^b\mathrm{g}(x)\mathrm{d}x$ or $\int_a^b\mathrm{f}(x)\mathrm{d}x-\frac{1}{2}\times2\times8$ Ignore limits (These can be either way round)
M1	Attempt the integration. Limits not needed.
M1	Substitute the correct limits. $\left(\text{May be implied by }\pm\frac{4}{3}\right)$
A1	$\frac{4}{3}$ **NB** If no integration is seen then M0M0A0 is awarded for the last 3 marks for an answer of $\frac{4}{3}$