Question Number	Scheme	Marks
1.	$\int\left(\frac{8x^3}{5}-\frac{2}{3x^4}-1\right)\mathrm{d}x=\frac{1}{4}\times\frac{8x^4}{5}-\frac{2}{3}\times\frac{1}{-3}x^{-3}-x$	M1 A1
	$\frac{2}{5}x^4+\frac{2}{9}x^{-3}-x+c$	A1 A1
		(4)
		Total 4

M1: For $x^3\to x^4$ or $x^{-4}\to x^{-3}$ or $1\to x$. Also allow eg $x^3\to x^{3+1}$

A1: Any 2 correct unsimplified or simplified terms, which may appear on separate lines. The indices must be processed but fractions within fractions are acceptable. The + *c* does not count as a correct term here.

A1: For any 2 correct simplified terms of $\frac{2}{5}x^4+\frac{2}{9}x^{-3}-x$, which may appear on separate lines. The + *c* does not count as a correct term here.

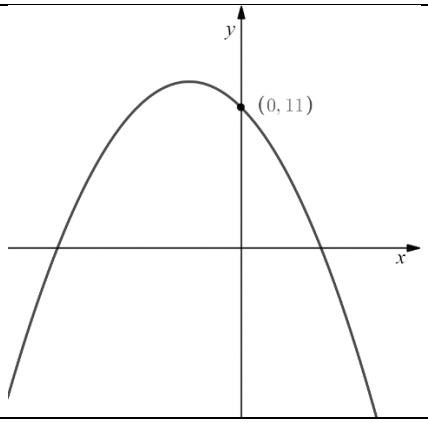
Accept exact decimals including eg. $0.\dot{2}$ for coefficients. Condone $-1x$ $-1x^1$, $-\frac{x}{1}$, $+-1x^1$ for this mark.

A1: $\frac{2}{5}x^4+\frac{2}{9}x^{-3}-x+c$ or simplified equivalent. All correct and on the same line (in any order) including a constant of integration. $\frac{2}{9x^3}$ is acceptable but not $\frac{^2/_9}{x^3}$.

Accept exact decimals including eg. $0.\dot{2}$ for coefficients. Condone $-1x$ only. Isw after a correct answer. Give the benefit of the doubt to terms such as $^2/_{9x^3}$ where it is unclear whether the x^3 term is on the denominator or not provided no incorrect working is seen.

Award once a correct expression is seen and isw but if there is any additional/incorrect notation and no correct expression has been seen on its own, withhold the final mark.

Eg. $\int\frac{2}{5}x^4+\frac{2}{9}x^{-3}-x+c\ \mathrm{d}x$ $\qquad$ $\frac{2}{5}x^4+\frac{2}{9}x^{-3}-x+c=0$

Question Number	Scheme	Marks
2(a)	$\mathrm{f}(x)=11-4x-2x^2$ $\Rightarrow ...\underline{-2}\left(2x+x^2\right)...$ or $\Rightarrow ...\underline{-2}\left(2x+x^2...\right)$	B1
	$...\left(2x+x^2\right)\Rightarrow ....\left(\left(x+1\right)^2\pm ...\right)$	M1
	$\left(\mathrm{f}(x)=\right)\ 13-2\left(x+1\right)^2$	A1
		(3)
(b)		M1
		A1
		(2)
(c)	$x=-1$	B1ft
		(1)
		Total 6
Alt(a)	$a+b(x^2+2cx+c^2)=11-4x-2x^2$ $b=-2$	B1
	$2bc=-4\Rightarrow c=...\ (=1)$	M1
	$a+bc^2=-4\Rightarrow a=...\ (=13)$ $\left(\mathrm{f}(x)=\right)\ 13-2\left(x+1\right)^2$	A1

(a)

B1: $b=-2$

M1: Attempts to complete the square on $x^2\pm 2x$ so score for $(x\pm 1)^2\pm ...$ or alternatively attempts to compare coefficients to find a value for c.
Condone $11-4x-2x^2\Rightarrow ...-2(2x-x^2)...\Rightarrow -2(x\pm 1)^2\pm ...$

A1: $13-2\left(x+1\right)^2$. If a, b and c are stated and there is a contradiction then mark their final expression. Condone $13+-2\left(x+1\right)^2$ or just the values of a, b and c being stated.