Question	Answer	Marks	Guidance
(a)	$\frac{d^2y}{dx^2}=6(-1)^2-\frac{4}{(-1)^3}>0\therefore$ minimum **or** $\frac{d^2y}{dx^2}=10\ \therefore$ minimum	**B1**	Sub $x=-1$ into $\frac{d^2y}{dx^2}$, correct conclusion. WWW
		1	
(b)	$\frac{dy}{dx}=2x^3+\frac{2}{x^2}[+c]$	***M1**	Integrating $\frac{d^2y}{dx^2}$ (at least one term correct).
	$0=-2+2+c$ leading to $c=[0]$	**DM1**	Substituting $x=-1, \frac{dy}{dx}=0$ (need to see) to evaluate c. DM0 if simply state $c=0$ or omit $+c$.
	$y=\frac{1}{2}x^4-\frac{2}{x}+(their\ c)x+k$	**A1 FT**	Integrated. FT *their* non-zero value of c if DM1 awarded.
	$\frac{9}{2}=\frac{1}{2}+2+k$ leading to $k=[2]$	**DM1**	Substituting $x=-1, y=\frac{9}{2}$ to evaluate k (dep on *M1).
	$y=\frac{1}{2}x^4-\frac{2}{x}+2$	**A1**	OE e.g. $2x^{-1}$ or $\frac{4}{2}$. A0 (wrong process) if c not evaluated but correct answer obtained.
		5	
(c)	$\frac{dy}{dx}=2x^3+\frac{2}{x^2}=0$	**M1**	*Their* $\frac{dy}{dx}=0$.
	Leading to $x^5=-1$	**M1**	Reaching equation of the form $x^5=a$.
	So only stationary point is when $x=-1$	**A1**	$x=-1$ and stating e.g. 'only' or 'no other solutions.
		3	

Question	Answer	Marks	Guidance
(d)	At $x = 1$, $\frac{dy}{dx} = [4]$	*M1	Substituting $x=1$ into *their* $\frac{dy}{dx}$.
	$\frac{dx}{dt} = \frac{dx}{dy} \times \frac{dy}{dt} = \frac{1}{4} \times 5$	DM1	OE Using chain rule correctly SOI.
	$\frac{5}{4}$	A1	OE e.g. 1.25.
		3	