Question Number	Scheme	Mark
1(a)	$(-2, -3)$	B1
		(1)
(b)	$(1, -9)$	B1B1
		(2)
(c)	$(4, 0)$	B1B1
		(2)
		(5 marks)

Condone omission of brackets throughout the question.
If the parts are not labelled, then mark the responses in the order they appear.

(a)
B1: Correct coordinates. Allow $x = -2,\ y = -3$

(b)
B1: One correct coordinate. Either $x = 1$ or $y = -9$
B1: Both coordinates correct. Allow $x = 1,\ y = -9$

(c)
B1: One correct coordinate. Either $x = 4$ or $y = 0$
B1: Both coordinates correct. Allow $x = 4,\ y = 0$

SC1: Allow a special case (b) B1B0 (c) B1B0 for **both** (b) $(-9, 1)$ (c) $(0, 4)$ but not for just one of these.
SC2: If they write their coordinates as vectors throughout then penalise the first occurrence only, and allow e.g. (a) B0, (b) B1B1, (c) B1B1.

Question Number	Scheme	Mark
2(a)	$\frac{1}{2}$	B1
		(1)
(b)	$\left\{\frac{dy}{dx}=\right\}\quad (3+2x)\ln 2x+\frac{1}{x}(3x+x^2)$ o.e.	M1A1
	$(3+2x)\ln 2x+\frac{1}{x}(3x+x^2)=0\Rightarrow \ln 2x=...$	dM1
	$\ln 2x=-\frac{3+x}{3+2x}\Rightarrow x=\frac{1}{2}e^{-\left(\frac{x+3}{2x+3}\right)}$ *	A1*
		(4)
(c)(i)	$\{x_2=\}\ \frac{1}{2}e^{-\frac{0.5+3}{2\times 0.5+3}}=0.2084310...$	M1
	awrt 0.2084	A1
(ii)	0.1948	A1
		(3)
		(8 marks)

(a)

B1: cao $\frac{1}{2}$ or 0.5. Condone (0.5, 0). There is no need to see $x = \ldots$ Ignore any solutions for $x \leqslant 0$

Must be clear that this is their answer to part (a) and not just $\frac{1}{2}$ or 0.5 seen anywhere.

(b)

M1: Attempts to use the product rule achieving $(A+Bx)\ln 2x+\frac{C}{x}(3x+x^2)$, A, B and C non-zero.

You may see e.g. $(3+x)\ln 2x+x\ln 2x+\frac{1}{x}x(3+x)$ if they do not expand the brackets before differentiating. Condone invisible brackets for this mark even if they are not recovered.

A1: $(3+2x)\ln 2x+3+x$ or unsimplified equivalent e.g. $(3+2x)\ln 2x+\frac{2}{2x}(3x+x^2)$

There is no need to see a LHS. Allow invisible brackets provided they are recovered.

dM1: Sets an expression of the form $(A+Bx)\ln 2x+\frac{C}{x}(3x+x^2)$ o.e. = 0, with A, B and C non-zero, and isolates $\ln 2x$ or $\ln x$ on one side. Dependent on the previous method mark.