Question	Answer	Marks	Partial Marks
7(a)	$\frac{dy}{dx} = (x^2-1)\frac{5}{2}(5x+2)^{-\frac{1}{2}} + 2x(5x+2)^{\frac{1}{2}}$	**B1**	For $\frac{5}{2}(5x+2)^{-\frac{1}{2}}$
		M1	For differentiation of a product
		A1	
	$\frac{dy}{dx} = \frac{(5x+2)^{-\frac{1}{2}}}{2}\left(5(x^2-1)+4x(5x+2)\right)$ or equivalent	**M1**	Dep on previous M mark for attempt to simplify
	$\frac{dy}{dx} = \frac{25x^2+8x-5}{2\sqrt{5x+2}}$	**A1**	
7(b)	$25x^2+8x-5=0$	**M1**	Equating their numerator in (a) to zero and attempt to solve
	$x = 0.315$	**A1**	
	$y = -1.70$	**A1**	
7(c)	Consideration of gradient or y values either side of stationary point, remembering that $x > 0$.	**M1**	Must be a complete method making use of *their* (a). Allow consideration of $25x^2+8x-5$ as a 'minimum curve'. Accept 2nd derivative method.
	Minimum	**A1**	
8(a)	$\mathbf{b}-\mathbf{a}$	**B1**	
8(b)	$\frac{1}{4}\mathbf{a}+\frac{1}{2}(\mathbf{b}-\mathbf{a})$ or $-\frac{3}{4}\mathbf{a}+\frac{1}{2}(\mathbf{a}+\mathbf{b})$	**B1**	For $\frac{1}{4}\mathbf{a}$ or $-\frac{3}{4}\mathbf{a}$
		B1	For $\frac{1}{2}(\mathbf{b}-\mathbf{a})$ or $\frac{1}{2}(\mathbf{a}+\mathbf{b})$
	$\frac{1}{2}\mathbf{b}-\frac{1}{4}\mathbf{a}$	**B1**	Correct and simplified
8(c)	$n\left(\frac{1}{2}\mathbf{b}-\frac{1}{4}\mathbf{a}\right)$	**B1**	**FT** on *their* answer to (b)
8(d)	$\frac{1}{2}(\mathbf{b}-\mathbf{a})+k\mathbf{b}$	**M1**	For use of *their* (a) and $k\mathbf{b}$
		A1	

Question	Answer	Marks	Partial Marks
8(e)	$\frac{1}{2}(\mathbf{b}-\mathbf{a})+k\mathbf{b}=n\left(\frac{1}{2}\mathbf{b}-\frac{1}{4}\mathbf{a}\right)$ $-\frac{1}{2}=-\frac{n}{4}$ $\frac{1}{2}+k=\frac{n}{2}$	**M1**	For equating *their* (c) and (d) and then equating like vectors to obtain 2 equations
	$n=2$	**A1**	
	$k=\frac{1}{2}$	**A1**	
9(a)(i)	$v=20\cos 2t$ when $t=\pi,\ v=20$	**B1**	
9(a)(ii)	$20\cos 2t=0$	**M1**	Equating *their* (i) to zero, must be a cosine and attempt to solve
	$t=\frac{\pi}{4}$	**A1**	
9(a)(iii)	$a=-40\sin 2t$	**M1**	Attempt to differentiate *their v*, dep on previous M mark, and use *their* value for (ii)
	–40	**A1**	
9(b)(i)	35	**B1**	
9(b)(ii)	$112.5=\frac{1}{2}(35+x)\times 5$	**M1**	Use of area under appropriate part of the graph
		A1	
	$x=10$	**A1**	
9(b)(iii)	$\frac{25}{5}=\frac{10}{t'}$	**M1**	Using a ratio method or otherwise, find extra time to stop = 2s or equivalent
	$t'=2$	**A1**	
	27	**A1**	