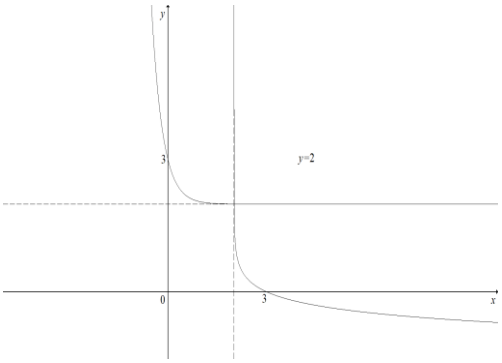
Question	Answer	Marks	Guidance
4(c)		**4**	**B1** for correct $y = \mathrm{f}(x)$ with *y*-intercept of 3. Must have correct asymptotic behaviour and be in the first and second quadrant. **B1dep** for correct reflection of $y = \mathrm{f}(x)$ to obtain $y = \mathrm{f}^{-1}(x)$ with *x*-intercept of 3. Must have correct asymptotic behaviour and be in the first and fourth quadrant. **B1** for asymptote of $y = 2$ stated or drawn through $y = 2$, must have a correctly shaped $y = \mathrm{f}(x)$ **B1** for asymptote of $x = 2$ stated or drawn or drawn through $x = 2$, must have a correctly shaped $y = \mathrm{f}^{-1}(x)$
4(d)	$\left(2 + \mathrm{e}^{-3x}\right)^{\frac{3}{2}} + 4$ soi	**B1**	For correct order
	$2 + \mathrm{e}^{-3x} = 4$	**M1**	For forming an equation, must be correct order
	$x = -\frac{1}{3}\ln 2$	**2**	**M1 dep** for correct attempt to solve for *x*.
5(a)	$\mathrm{p}'(x) = 15x^2 + 2ax + 39$ soi	**B1**	
	$\mathrm{p}'(-3)$: $135 - 6a + 39 = 0$ oe	**B1**	
	$\mathrm{p}(-3)$: $-135 + 9a - 117 + b = 0$ oe	**B1**	
	$a = 29$	**B1**	
	$b = -9$	**B1**	
5(b)	$\left[(x+3)\right]\left(5x^2 + 14x - 3\right)$	**2**	**M1** for attempt by any valid method, to obtain a quadratic with 2 correct terms or correct follow through on *their a* and *b*.
	$x = -3,\ \frac{1}{5}$	**A1**	For both

Question	Answer	Marks	Guidance
5(c)	$\text{cosec}2\theta = -3$ soi	**B1**	
	$\sin 2\theta = -\frac{1}{3}$ $2\theta = -19.47^o, 199.47^o, 340.53^o, 559.47^o, 700.53^o$ $\theta = 99.7^o, 170.3^o, 279.7^o, 350.3^o$	**4**	**M1** a correct double angle **M1** for correct order of operations to obtain one correct solution. May be implied by e.g. a correct solution or $\theta = -9.7^o$ or a correct angle in radians **A1** for 2 correct solutions **A1** for a further 2 correct solutions and no extra solutions within the range
6(a)(i)	$300 + \frac{1}{2}(10+V)40 + \frac{1}{2}50V = 2750$ or $700 + \frac{1}{2}(40\times(V-10)) + \frac{1}{2}50V = 2750$ oe	**M1**	Allow one slip, but must be considering complete area
	$V = 50$	**A1**	
6(a)(ii)	–1 nfww	**2**	**M1 FT** *their V* for a correct gradient calculation
6(b)(i)	$\left(\frac{dv}{dt} =\right)\ t\left(\frac{1}{2}\times 2t\times\left(t^2+5\right)^{-\frac{1}{2}}\right)+\left(t^2+5\right)^{\frac{1}{2}}$ soi	**3**	**B1** for $\frac{1}{2}\times 2t\times\left(t^2+5\right)^{-\frac{1}{2}}$ **M1** for a correct attempt at a product **A1** for all correct apart from $\frac{1}{2}\times 2t\times\left(t^2+5\right)^{-\frac{1}{2}}$
	$\frac{13}{3}$	**A1**	
6(b)(ii)	There is no change of sign for *v* as *v* is always positive, so no change in direction. oe	**B1**	
7(a)	$a(5x-2)^{\frac{1}{3}}$	**M1**	
	$\frac{3}{5}(5x-2)^{\frac{1}{3}}$ oe	**A1**	
	$\frac{3}{5}\left(18^{\frac{1}{3}}-2\right)$ or exact equivalent	**2**	**Dependent M1** for correct use of limits

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