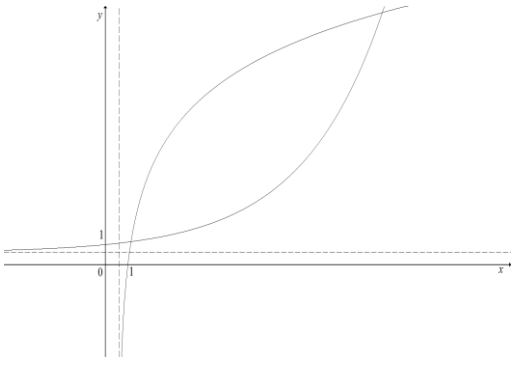
Question	Answer	Marks	Guidance
3(a)	$ACB = 2\tan^{-1}\left(\frac{12}{5}\right)$ oe	**M1**	
	$ACB = (2\times 1.176\ldots)$ = 2.35 to 2 dp	**A1**	Must see justification to 2 dp
3(b)	Arc length = $5\times ACB$	**B1**	
	Perimeter = 35.8	**B1**	Allow awrt 35.8
3(c)	Area = $(12\times 5)-\left(\frac{1}{2}\times 5^2\times 2.35\right)$	**M2**	**M1** for area of kite or area of sector **M1 dep** for kite area – sector area
	30.6	**A1**	Allow greater accuracy Any use of fractions gets **A0**
4(a)(i)	$\frac{2}{3}$	**B1**	Allow $x>\frac{2}{3}$, $a=\frac{2}{3}$, but not $x=\frac{2}{3}$ unless it is replaced with a correct answer
4(a)(ii)	$\mathbb{R}$ oe	**B1**	Must be using correct notation
4(a)(iii)	$3y-2=e^{\frac{x}{4}}$ or $3x-2=e^{\frac{y}{4}}$	**M1**	For valid attempt to reach this stage
	$f^{-1}(x)=\frac{1}{3}\left(e^{\frac{x}{4}}+2\right)$	**A1**	Must be using correct notation
	Domain $x\in\mathbb{R}$ Range $f^{-1}>\frac{2}{3}$	**B2**	**B1** for each, must be using the correct notation.
4(a)(iv)		**4**	**B1** for the shape of $y = f(x)$ in the first and fourth quadrants only **B1 dep** on previous **B1** for (1, 0) **B1** for a correct shape for $f^{-1}(x)$, or **FT** on *their* $y = f(x)$ with correct shape in first quadrant for symmetry about $y = x$ soi **B1 dep** on previous **B1**, for (0, 1) and at least one point of intersection with $y = f(x)$ correct in the first quadrant

Question	Answer	Marks	Guidance
4(b)	$\left(2\left((2x+1)^{\frac{1}{2}}+4\right)+1\right)^{\frac{1}{2}}+4$	**B1**	
	$(2x+1)^{\frac{1}{2}}=8$	**B1**	**Dep**
	$x = 31.5$ oe	**B1**	**Dep** on both previous **B** marks
	Alternative		
	g(x) = 9, x = 12	**(B1)**	
	g(x) = 12	**(B1)**	**Dep**
	x = 31.5 oe	**(B1)**	**Dep** on both previous **B** marks
5(a)	$\frac{\text{cosec}^2\theta}{\cot^2\theta}=\frac{1}{\sin^2\theta}\times\frac{\sin^2\theta}{\cos^2\theta}$ $=\frac{1}{\cos^2\theta}=\sec^2\theta$	**B1**	Sufficient detail is needed Do not award if θ is consistently omitted
	Alternative 1		
	$\frac{\frac{\sin^2\theta+\cos^2\theta}{\sin^2\theta}}{\frac{\cos^2\theta}{\sin^2\theta}}$ $=\frac{1}{\cos^2\theta}=\sec^2\theta$	**(B1)**	Sufficient detail is needed Do not award if θ is consistently omitted
	Alternative 2		
	$\frac{1}{\cot^2\theta}+1$ $\tan^2\theta+1$	**(B1)**	Sufficient detail is needed Do not award if θ is consistently omitted
5(b)	$\sec^2\theta$	**B1**	
5(c)	$\int\left(\sec^2\theta-\sin\theta\right)\text{d}\theta$ soi	**B1**	
	$\tan\theta+\cos\theta$	**B2**	**B1** for each
	$\sqrt{3}-\frac{1}{2}$ or exact equivalent	**B1**	**Dep** on 3 previous **B** marks
6(a)	$x^{10}+20x^7+180x^4$	**3**	**B1** for each correct term