Question	Answer	Marks	Guidance
(a)	$x \neq 1$ or $x < 1$, $x > 1$ or $(-\infty, 1), (1, \infty)$ $[x \in \mathbb{R}]$	**B1**	Must be x not $f^{-1}(x)$ or y. Do not accept $1 < x < 1$.
		1	
(b)	$y = \frac{2x+1}{2x-1}$ leading to $(2x-1)y = 2x+1$ leading to $2xy - y = 2x+1$	***M1**	Setting $y =$, removing fraction and expanding brackets.
	$2xy - 2x = y + 1$ leading to $2x(y-1) = y+1$ leading to $x = \frac{y+1}{2(y-1)}$	**DM1**	Reorganising to get $x =$. Condone ± sign errors only.
	$[f^{-1}(x)] = \frac{x+1}{2(x-1)}$, $\frac{x+1}{x-1} \times \frac{1}{2}$ or $\frac{1}{x-1} + \frac{1}{2}$	**A1**	OE. Must be in terms of x. Do not allow $\frac{x+1}{x-1} \div 2$.
		3	
(c)	$(their\ f^{-1}(3))$ leading to $(their\ f^{-1}(3))^2 + 4$ $[f^{-1}(3) = 1, 1+4=]$	**M1**	Correct order of operations and substitution of $x = 3$ needed.
	5	**A1**	
		2	
(d)	Sight of 'not one to one' or 'many to one' or 'one to many'	**B1**	Any reason mentioning 2 values, or + and — , such as: square root gives 2 values or horizontal line test crosses curve twice or 2 values because of turning point or 2 values because it is a quadratic.
		1	

Question	Answer	Marks	Guidance
(e)	$\mathrm{f}(x)=1+\dfrac{2}{2x-1}=\dfrac{2x-1}{2x-1}+\dfrac{2}{2x-1}=\dfrac{2x+1}{2x-1}$	**B1**	AG Do not condone equating expressions and verification.
	$\mathrm{f}'(x)=-4(2x-1)^{-2}$ or $2(2x-1)^{-1}+\left\{-(2x+1)2(2x-1)^{-2}\right\}$ or $\dfrac{(2\boldsymbol{x}-1)2-2(2\boldsymbol{x}+1)}{(2\boldsymbol{x}-1)^2}$	***M1**	For $k(2x-1)^{-2}$ and no other terms or correct use of the product or quotient rule then ISW.
	Gradient $m=-4$	**A1**	Differentiation must have clearly taken place.
	Equation of tangent is $y-3=-4(x-1)\quad[\Rightarrow y=-4x+7]$	**DM1**	Using (1, 3) in the equation of a line with *their* gradient.
	Crosses axes at $\left(\dfrac{7}{4},0\right)$ and $(0,7)$	**A1 FT**	SOI from *their* straight line or by integration from 0 to '*their* 7/4'.
	[Area =] $\dfrac{49}{8}$	**A1**	OE e.g. 6.13 AWRT. If M0 A0 DM0, **SC B2** available for correct answer.
		6	