

Q	Marking Instructions	AO	Marks	Typical Solution
10(a)	Makes a deduction about the lower bound of the function (4)	AO2.2a	B1	The range of f is the set $(x : x > 4, x \in \mathbb{R})$
	Correctly states the range of f using set notation	AO2.5	B1	
(b)(i)	States correctly the set they gave in part (a)	AO1.2	B1F	$(x : x > 4, x \in \mathbb{R})$
(b)(ii)	Interchanges x and y at any stage	AO1.1a	M1	$y = 4 + 3^{-x}$ $x = 4 + 3^{-y}$ $3^{-y} = x - 4$ $-y = \log_3(x - 4)$ $f^{-1}(x) = -\log_3(x - 4)$
	Rearranges and takes logs	AO1.1a	M1	
	Obtains correct expression from completely correct working for $f^{-1}(x)$, notation correct throughout	AO1.1b	A1	
(c)(i)	Obtains $gf(x)$	AO1.1b	B1	$gf(x) = g(4 + 3^{-x})$ $= 5 - (4 + 3^{-x})^{0.5}$
(c)(ii)	Forms equation and rearranges using 'their' $gf(x) = 2$	AO1.1a	M1	$5 - (4 + 3^{-x})^{0.5} = 2$ $(4 + 3^{-x}) = 9$ $3^{-x} = 5$ $x = -\log_3 5$
	Correctly rearranges to get a single exponential term where logs can be taken. (Follow through provided 'their' equation requires the use of logs.)	AO1.1b	A1F	
	Obtains correct solution	AO1.1b	A1	
Total			10	