Question	Scheme	Marks	AOs
1	$g(x)=\dfrac{2x+5}{x-3},\ x\geqslant 5$		
(a) Way 1	$g(5)=\dfrac{2(5)+5}{5-3}=7.5 \Rightarrow gg(5)=\dfrac{2("7.5")+5}{"7.5"-3}$	M1	1.1b
	$gg(5)=\dfrac{40}{9}\ \left(\text{or } 4\dfrac{4}{9} \text{ or } 4.\dot{4}\right)$	A1	1.1b
		(2)	
(a) Way 2	$gg(x)=\dfrac{2\left(\dfrac{2x+5}{x-3}\right)+5}{\left(\dfrac{2x+5}{x-3}\right)-3} \Rightarrow gg(5)=\dfrac{2\left(\dfrac{2(5)+5}{(5)-3}\right)+5}{\left(\dfrac{2(5)+5}{(5)-3}\right)-3}$	M1	1.1b
	$gg(5)=\dfrac{40}{9}\ \left(\text{or } 4\dfrac{4}{9} \text{ or } 4.\dot{4}\right)$	A1	1.1b
		(2)	
(b)	{Range:} $2<y\leqslant\dfrac{15}{2}$	B1	1.1b
		(1)	
(c) Way 1	$y=\dfrac{2x+5}{x-3}\Rightarrow\ yx-3y=2x+5\Rightarrow yx-2x=3y+5$	M1	1.1b
	$x(y-2)=3y+5 \Rightarrow\ x=\dfrac{3y+5}{y-2}\quad\left\{\text{or } y=\dfrac{3x+5}{x-2}\right\}$	M1	2.1
	$g^{-1}(x)=\dfrac{3x+5}{x-2},\quad 2<x\leqslant\dfrac{15}{2}$	A1ft	2.5
		(3)	
(c) Way 2	$y=\dfrac{2x-6+11}{x-3}\Rightarrow\ y=2+\dfrac{11}{x-3}\Rightarrow y-2=\dfrac{11}{x-3}$	M1	1.1b
	$x-3=\dfrac{11}{y-2}\Rightarrow x=\dfrac{11}{y-2}+3\quad\left\{\text{or } y=\dfrac{11}{x-2}+3\right\}$	M1	2.1
	$g^{-1}(x)=\dfrac{11}{x-2}+3,\quad 2<x\leqslant\dfrac{15}{2}$	A1ft	2.5
		(3)	
			(6 marks)

Notes for Question 1

(a)	
M1:	Full method of attempting g(5) and substituting the result into g
Note:	**Way 2:** Attempts to substitute $x=5$ into $\dfrac{2\left(\dfrac{2x+5}{x-3}\right)+5}{\left(\dfrac{2x+5}{x-3}\right)-3}$, o.e. Note that $gg(x)=\dfrac{9x-5}{14-x}$
A1:	Obtains $\dfrac{40}{9}$ or $4\dfrac{4}{9}$ or $4.\dot{4}$ or an exact equivalent
Note:	Give A0 for 4.4 or 4.444... without reference to $\dfrac{40}{9}$ or $4\dfrac{4}{9}$ or $4.\dot{4}$

Notes for Question 1 Continued	
(b)	
B1:	States $2 < y \leq \frac{15}{2}$ Accept any of $2 < g \leq \frac{15}{2}$, $2 < g(x) \leq \frac{15}{2}$, $\left(2, \frac{15}{2}\right]$
Note:	Accept $g(x) > 2$ **and** $g(x) \leq \frac{15}{2}$ o.e.
(c) Way 1	
M1:	Correct method of cross multiplication followed by an attempt to collect terms in x or terms in a swapped y
M1:	A complete method (i.e. as above and also factorising and dividing) to find the inverse
A1ft:	Uses correct notation to correctly define the inverse function g^{-1}, where the domain of g^{-1} stated correctly or correctly followed through (using correct notation) on the values shown in their range in part (b). Allow $g^{-1} : x \rightarrow$. Condone $g^{-1} = ...$ Do not accept $y = ...$
Note:	Correct notation is required when stating the domain of $g^{-1}(x)$. Allow $2 < x \leq \frac{15}{2}$ or $\left(2, \frac{15}{2}\right]$ Do not allow any of e.g. $2 < g \leq \frac{15}{2}$, $2 < g^{-1}(x) \leq \frac{15}{2}$
Note:	Do not allow A1ft for following through their range in (b) to give a domain for g^{-1} as $x \in \mathbb{R}$
(c) Way 2	
M1:	Writes $y = \frac{2x+5}{x-3}$ in the form $y = 2 \pm \frac{k}{x-3}$, $k \neq 0$ and rearranges to isolate y and 2 on one side of their equation. **Note:** Allow the equivalent method with x swapped with y
M1:	A complete method to find the inverse
A1ft:	As in Way 1
Note:	If a candidate scores no marks in part (c), but • states the domain of g^{-1} correctly, **or** • states a domain of g^{-1} which is correctly followed through on the values shown in their range in part (b) then give special case (SC) M1 M0 A0