	Marks	AOs
$fg(4) = f(2+3(4)-4^2) = f(-2) =$	M1	1.1b
$=\frac{2k}{5}$	A1	1.1b
$y \in \mathbb{R}, \ \ y \neq \frac{k}{2}$	В1	2.2a
$y = \frac{kx}{2x-1} \Rightarrow 2xy - y = kx \Rightarrow x(2y-k) = y$	M1	2.1
$f^{-1}(x) = \frac{x}{2x - k}$	Al	2.5
$x \neq \frac{k}{2}$	B1ft	2.5
	(6)	
$f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow \frac{2}{4-k} = \frac{11}{3(4)} \Rightarrow k =$	M1	3.1a
$24 = 44 - 11k \Rightarrow k = \frac{20}{11}$	A1	1.1b
	(2)	
(b) Alternative:		
$f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow f\left(\frac{11}{3g(2)}\right) = 2 \Rightarrow f\left(\frac{11}{12}\right) \Rightarrow k = \dots$	M1	3.1a
$\frac{11}{10}k = 2 \Longrightarrow k = \frac{20}{11}$	A1	1.1b
(8 marks)		
Notes		
<ul> <li>(a)(i)</li> <li>M1: Full method to find g(4) and substitute the result into f. Also allow for an attempt to substitute x = 4 into an attempt at fg(x).</li> <li>A1: Correct expression</li> <li>(ii)</li> <li>B1: Correct range (Allow x∈ℝ, x≠k/2)</li> <li>(iii)</li> <li>M1: Correct attempt to cross multiply followed by an attempt to factorise out x.</li> <li>A1: Correct expression using the correct notation. Allow f<sup>-1</sup> = or f<sup>-1</sup>: x → but not y =</li> <li>B1ft: The correct domain or follow through their answer to (ii).</li> <li>(b)</li> <li>M1: A complete strategy to find k.</li> <li>A1: Deduces the correct exact value.</li> </ul>		
	$y \in \mathbb{R}, \ y \neq \frac{k}{2}$ $y = \frac{kx}{2x-1} \Rightarrow 2xy - y = kx \Rightarrow x(2y-k) = y$ $f^{-1}(x) = \frac{x}{2x-k}$ $x \neq \frac{k}{2}$ $f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow \frac{2}{4-k} = \frac{11}{3(4)} \Rightarrow k = \dots$ $24 = 44 - 11k \Rightarrow k = \frac{20}{11}$ (b) Alternative: $f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow f\left(\frac{11}{3g(2)}\right) = 2 \Rightarrow f\left(\frac{11}{12}\right) \Rightarrow k = \dots$ $\frac{11}{10}k = 2 \Rightarrow k = \frac{20}{11}$ Notes  The substitute the result into f. Also allow for an att and an attempt at fg(x). In the substitute the result into f. Also allow for an att and an attempt at fg(x). In the substitute the result into f. Also allow for an att and an attempt at fg(x). In the substitute for the result into f. Also allow for an att and an attempt at fg(x). In the substitute for the result into f. Also allow for an att and an attempt at fg(x). In the substitute figure for the substitute for the result into f. Also allow for an attempt at figure for the substitute figure for the s	$= \frac{2k}{5}$ $y \in \mathbb{R}, \ y \neq \frac{k}{2}$ $B1$ $y = \frac{kx}{2x-1} \Rightarrow 2xy - y = kx \Rightarrow x(2y-k) = y$ $M1$ $f^{-1}(x) = \frac{x}{2x-k}$ $A1$ $x \neq \frac{k}{2}$ $B1ft$ $(6)$ $f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow \frac{2}{4-k} = \frac{11}{3(4)} \Rightarrow k =$ $M1$ $24 = 44 - 11k \Rightarrow k = \frac{20}{11}$ $A1$ $(2)$ $(b) \text{ Alternative:}$ $f^{-1}(2) = \frac{11}{3g(2)} \Rightarrow f\left(\frac{11}{3g(2)}\right) = 2 \Rightarrow f\left(\frac{11}{12}\right) \Rightarrow k =$ $M1$ $\frac{11}{10}k = 2 \Rightarrow k = \frac{20}{11}$ $A1$ $\frac{11}{10}k = 2 \Rightarrow k = \frac{20}{11}$ $A1$ $(8)$ Notes  The substitute the result into f. Also allow for an attempt to $x = 4$ into an attempt at $x = 4$ int