Question	Scheme	Marks	AOs
3(a)	$y > 2$	B1	2.5
		(1)	
(b)	$\mathrm{fg}(x) = \mathrm{e}^{3\ln x} + 2 = \mathrm{e}^{\ln x^3} + 2$	M1	2.1
	$= x^3 + 2$	A1	1.1b
		(2)	
(c)	$y = \mathrm{e}^{3x} + 2 \Rightarrow y - 2 = \mathrm{e}^{3x} \Rightarrow 3x = \ln(y-2)$	M1	1.1b
	$\mathrm{f}^{-1}(x) = \dfrac{1}{3}\ln(x-2)$	A1	1.1b
	$x > 2$	B1ft	2.2a
		(3)	
		(6 marks)	

Notes

(a)

B1: Correct range. Allow f(x) or f for y. Allow e.g. $\{y \in \mathbb{R}: \ y > 2\}$, $2 < y < \infty$, $(2, \infty)$

(b)

M1: Attempts the composite function the correct way round and applies $3\ln x = \ln x^3$

A1: Correct expression (ignore any domain given)

(c)

M1: Attempts the inverse function and reaches $\alpha x = \ln(y \pm 2)$ or $\alpha y = \ln(x \pm 2)$

A1: Correct inverse (the function must be in terms of x but allow $\mathrm{f}^{-1}(x) = ...$ or e.g. $y = \ldots$ but not $x = \ldots$)

B1ft: Correct domain. Follow through their answer to part (a) but must be in terms of x.