

1

Consider the functions $f(x) = e^{2x+1}$ and $g(x) = \ln \sqrt{x}$. [calculator allowed]

(a) (i) Find $f^{-1}(x)$ (ii) Find $g^{-1}(x)$

(b) Show that $g(f(x)) = x + \frac{1}{2}$

2

Consider the function $g(x) = \ln(x+2)$

(a) State the domain and range of the function f .

(b) Find $g^{-1}(x)$, the inverse of g .

3

Find the domain and range for the function $f(x) = \frac{1}{1 - \ln\left(\frac{2}{x}\right)}$

4

- (a) What is the inverse of the function $y = e^x$? _____
- (b) Sketch the graph of $f(x) = e^x + 1$ on the grid below. Label it $f(x)$. The graph of $y = e^x + 1$ has one asymptote. What is the equation of this asymptote? _____
- (c) Sketch a graph of the inverse of $f(x) = e^x + 1$. Label it $f^{-1}(x)$. The graph of $f^{-1}(x)$ has one asymptote. What is the equation of this asymptote? _____
- (d) Find the equation for $f^{-1}(x)$. _____ **[8 marks]**

