4. If $f(x) = e^{ax+b}$, find $f^{-1}(x)$.

5. If $f(x) = \frac{x}{1-\sqrt{x}}$, $x \geq 0$ and $g(x) = 3x+1$, solve the equation $f^{-1}g(x) = \frac{9}{16}$.

Hint: do not attempt to find $f^{-1}(x)$.

6. A function is defined in the following table:

x	1	2	3	4	5	6	7	8	9
$f(x)$	7	1	6	4	2	4	9	8	3

(a) Find $f \circ f(3)$.

(b) Find $f^{-1}(9)$.

7. Differentiate $y = e^{x^2} + \frac{\sin 3x}{2x}$.

8. Find the values of x for which the function $f(x) = \ln\left(\frac{2}{x^2-12}\right)$ has a gradient of 2.

9. Given that $f(x) = \frac{x^2-1}{x^2+2}$, find $f''(x)$ in the form $\frac{a-bx^2}{(x^2+2)^3}$.

10. Find the equation of the normal to the curve $y = e^{-3x^2}$ at the point where $x = 2$.

11. A tangent to the curve $y = \tan x$ for $-\frac{\pi}{2} < x < \frac{\pi}{2}$ is drawn at the point where $x = \frac{\pi}{4}$. Find the x-coordinate of the point where this tangent intersects the curve again.

12. Find and classify the stationary points on the curve $y = x^3 - 3x + 8$.

13. Find and classify the stationary points on the curve $y = x\sin x + \cos x$ for $0 < x < 2\pi$.

14. Find the maximum value of $y = \ln(x - \sin^2 x)$ for $0 < x \leq 2\pi$.