

9 The function $f(x)$ is defined on all real numbers by $f(x) = x^3 + e^{3x}$.

(a) Differentiate $x^3 + e^{3x}$. **[2]**

(b) Write down the coordinates of the point where the curve $y = f(x)$ crosses the y -axis. **[1]**

(c) Find the gradient of the curve of the inverse function, $y = f^{-1}(x)$, at the point where it crosses the x -axis. **[2]**