11 The gradient function of a curve is given by $\frac{dy}{dx} = \frac{3x^2 \ln x}{e^{3y}}$.

The curve passes through the point (e, 1).

(a) Find the equation of this curve, giving your answer in the form $e^{3y} = f(x)$. **[6]**

(b) Show that, when $x = e^2$, the y-coordinate of this curve can be written as $y = a + \frac{1}{3}\ln(be^3 + c)$, where a, b and c are constants to be determined. **[3]**