9 A particle moves in a straight line such that, t seconds after passing a fixed point O, its displacement from O is s m, where $s = e^{2t} - 10e^{t} - 12t + 9$.

(a) Find expressions for the velocity and acceleration at time t. [3]

(b) Find the time when the particle is instantaneously at rest. [3]

(c) Find the acceleration at this time. [2]

10 The gradient of the normal to a curve at the point (x, y) is given by $\frac{x}{x+1}$.

(a) Given that the curve passes through the point (1, 4), show that its equation is $y = 5 - \ln x - x$. [5]