12. (a) Find

$$\int x^2 e^{x^3}\,dx$$

(2)

(b) Using the substitution $u = x^3$ or otherwise, show by integration that

$$\int x^8 e^{x^3}\,dx = \frac{1}{3}e^{x^3}\left(x^6 + Ax^3 + B\right) + c$$

where A and B are constants to be found and c is an arbitrary constant.

(5)