7 **In this question you must show detailed reasoning.**

(a) Nigel is asked to determine whether $(x+7)$ is a factor of $x^3-37x+84$. He substitutes $x=7$ and calculates $7^3-37\times7+84$. This comes to 168, so Nigel concludes that $(x+7)$ is not a factor.

Nigel's conclusion is wrong.

- Explain why Nigel's argument is not valid.
- Show that $(x+7)$ is a factor of $x^3-37x+84$. **[2]**

(b) Sketch the graph of $y=x^3-37x+84$, indicating the coordinates of the points at which the curve crosses the coordinate axes. **[5]**

(c) The graph in part **(b)** is translated by $\begin{pmatrix}1\\0\end{pmatrix}$. Find the equation of the translated graph, giving your answer in the form $y=x^3+ax^2+bx+c$ where a, b and c are integers. **[4]**