Question 7 **(13 marks)**

Consider the function $f(x) = e^{2x} - 4e^{x}$.

(a) Determine the coordinates of the x-intercept(s) of f. You may wish to consider the factorised version of $f: f(x) = e^{x}(e^{x} - 4)$. (3 marks)

(b) Show that there is only one turning point on the graph of f, which is located at $(\ln(2), -4)$. (3 marks)

(c) Determine the coordinates of the point(s) of inflection of f. (3 marks)

(d) Sketch the function f on the axes below, labelling clearly all intercepts, the turning point and point(s) of inflection. Some approximate values of the natural logarithmic function provided in the table below may be helpful. (4 marks)

x	1	2	3	4
$\ln(x)$	0	0.7	1.1	1.4