Question 3 **(7 marks)**

Consider the function $f(x) = \dfrac{(x-1)^2}{e^x}$.

(a) Show that the first derivative is $f'(x) = \dfrac{-x^2 + 4x - 3}{e^x}$. (2 marks)

(b) Use your result from part (a) to explain why there are stationary points at $x = 1$ and $x = 3$. (2 marks)

It can be shown that the second derivative is $f''(x) = \dfrac{x^2 - 6x + 7}{e^x}$.

(c) Use the second derivative to describe the type of stationary points at $x = 1$ and $x = 3$.

(3 marks)