Sketching a Graph Using Derivatives

1. Consider the function

$$f(x) = \frac{1}{\sqrt{8\pi}} e^{-\frac{(x-1)^2}{8}}$$

Given that the first and second derivatives are:

$$f'(x) = \frac{1}{8\sqrt{2\pi}}(x-1)e^{-\frac{(x-1)^2}{8}}$$
$$f''(x) = \frac{1}{32\sqrt{2\pi}}(x^2-2x-3)e^{-\frac{(x-1)^2}{8}}$$

(a) What are the critical points of $f(x)$. Is there a local max or min ? (Make sure to give the actual point(s) not just the x-values).

(b) What are the points of inflection ? (Make sure to give the actual points, not just the x values). Intervals of concavity?

(c) Sketch the graph of $f(x)$, making sure to label all the points you found above.

(d) Bonus question: $f(x)$ is actually a special type of function. What special function is it?