Problem 1. (10 points) Find all the local minimum, local maximum, and inflection points of the function

\[ h(t) = t^2 + \frac{8}{t}. \]

Be sure to indicate how you tell local minimum from local maximum.
Problem 2. (10 points) Each of the functions in the left column satisfies at least one differential equation in the right column. Match each function with its differential equation(s), showing your work in the space below.

\[
\begin{align*}
&y = 8 \cdot 3^x - 1 \\
&y = 3 \sin x - \cos x \\
&y = \frac{1}{3} x^3 - 1 \\
&y' = x^2 \\
&y'' = -y \\
&y' = (\ln 3)(y + 1) \\
&y' = y^2 \\
&y' = 3(y + 1)^{2/3}
\end{align*}
\]

Problem 3. (5 points) Give an example of two different functions which have the same derivative. Explain, in one or two sentences, why the opposite (one function having two different derivatives) is absolutely impossible.