Each problem of #(1)–#(3) is worth 5 points.
Let \( f(x) = \frac{1}{3}x^3 - x^2 - 3x + 1 \) be given.

1. Find all critical points of the given \( f \) above.

\[
f'(x) = x^2 - 2x - 3
\]
\[
= (x-3)(x+1)
\]

\[
f'(x) = 0 \implies (x-3)(x+1) = 0
\]
\[
\implies \boxed{x = 3 \text{ or } -1} \leftarrow \text{critical points of } f.
\]

2. Find a local maximum and a local minimum of \( f \) given in the above.

\[
f''(x) = 2x - 2
\]

\[
f''(3) = 6 - 2 = 4 > 0 \quad \land \quad f \text{ has a local min at } x = 3
\]

\[
f''(-1) = -2 - 2 = -4 < 0 \quad \land \quad f \text{ has a local max at } x = -1.
\]

3. Find all inflection points of \( f \) given in the above (here, you need to justify why they are inflection points).

\[
f''(x) = 2x - 2 = 0
\]

\[
\implies x = 1
\]

\[
\begin{array}{c|c|c}
 x & 1 & \\
 f'' & - & + \\
\end{array}
\]

\[
\implies \text{The concavity changes at } x = 1.
\]

So \( x = 1 \) is an inflection point.