5. [13 points] Suppose $f(x)$ is a function defined for all $x$ whose derivative and second derivative are given by

$$f'(x) = \frac{(x + 2)^2(x - 3)}{(x + 1)^{1/3}} \quad \text{and} \quad f''(x) = \frac{2(x + 2)(x - 1)(4x + 3)}{3(x + 1)^{4/3}}.$$

a. [2 points] Find the $x$-coordinates of all critical points of $f(x)$. If there are none, write NONE.

**Answer:** Critical point(s) at $x =$ ____________________________

b. [6 points] Find the $x$-coordinates of all local extrema of $f(x)$.
If there are none of a particular type, write NONE.
Justify your answers, and be sure to show enough evidence to demonstrate that you have found all local extrema.

**Answer:** Local min(s) at $x =$ ____________________________

**Answer:** Local max(es) at $x =$ ____________________________

c. [5 points] Find the $x$-coordinates of all inflection points of $f(x)$. If there are none, write NONE.
Justify your answers, and be sure to show enough evidence to demonstrate that you have found all inflection points.

**Answer:** Inflection point(s) at $x =$ ____________________________