3. [12 points] Suppose \( q(x) \) is a differentiable function defined for all real numbers \( x \). The derivative and second derivative of \( q(x) \) are given by

\[
q'(x) = x^{2/3}(x - 3)^{5/3}(x + 5) \quad \text{and} \quad q''(x) = \frac{10(x - 3)^{2/3}(x - 1)(x + 3)}{3x^{1/3}}.
\]

a. [1 point] Find the \( x \)-coordinates of all critical points of \( q(x) \). If there are none, write NONE.

**Answer:** Critical point(s) of \( q(x) \) at \( x = \) ________________

b. [2 points] Find the \( x \)-coordinates of all critical points of \( q'(x) \). If there are none, write NONE.

**Answer:** Critical point(s) of \( q'(x) \) at \( x = \) ________________

c. [5 points] Find the \( x \)-coordinates of all local maxima and local minima of \( q(x) \). If there are none of a particular type, write NONE. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all local extrema.

**Answer:** Local max(es) at \( x = \) _______________ and Local min(s) at \( x = \) _______________

d. [4 points] Find the \( x \)-coordinates of all inflection points of \( q(x) \). If there are none, write NONE. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all inflection points.

**Answer:** Inflection point(s) at \( x = \) _______________