2. [12 points] Let $g(x)$ be a continuous function whose first and second derivatives are given below.

$$g'(x) = e^{2x} (2x - 1)^3 (x - 3)^4 \qquad \text{and} \qquad g''(x) = 4e^{2x} (x^2 - 4) (2x - 1)^2 (x - 3)^3$$

a. [6 points] Find all values of x at which $g(x)$ has a local extremum. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all local extrema. For each answer blank below, write NONE if appropriate.

Local max(es) at $x =$ _____

Local min(s) at $x =$ _____

b. [6 points] Find all values of x at which $g(x)$ has an inflection point. Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all inflection points. Write NONE if $g(x)$ has no points of inflection.

Inflection point(s) at $x =$ _____