Calculus I

Name_____________________________________

Quiz 5

Class Time____________________________________

Directions: Answer each question. Simplify.

1.) Find all relative extrema using the First Derivative Test given the following functions. (3 pts)

\[ f(x) = x^{\frac{4}{5}}(x + 6) \]

\[ f'(x) = \frac{6x + 6}{5x^{\frac{4}{5}}} \]

Relative Min at \((-1, -5)\)

2.) Find all relative extrema using the Second Derivative Test given the following functions. (3 pts)

\[ g(x) = x^2e^x \]

\[ g'(x) = \frac{-x^2 + 2x}{e^x} \]

\[ g''(x) = \frac{x^2 - 4x + 2}{e^x} \]

Relative Min at \((0, 0)\)

Relative Max at \((2, 4e^2)\)

3.) Evaluate the limit. (2 pts)

\[ \lim_{t \to 0} \frac{e^{5t} - 1}{\sin(t)} \]