

Quiz 5

Student ID Number:

Name _____

Math 140B, 5PM

Please justify all your answers

February 21, 2019

Please also write your full name on the back

1. Suppose that f is differentiable on $[a, b]$ and $f'(a) < 0 < f'(b)$.

(a) Show that there are points $a < c < d < b$ such that $f(c) < f(a)$ and $f(d) < f(b)$.

(b) Show that the minimum of f on $[a, b]$ occurs at an interior point (i.e. it doesn't occur at a or b). Conclude that there is a point x_0 in (a, b) such that $f'(x_0) = 0$.

2. Find the Taylor polynomial of order 3, $P_3(x)$, of $f(x) = \sinh x = \frac{1}{2}(e^x - e^{-x})$. Find an upper bound for the remainder, $|f(x) - P_3(x)|$, at $x = 1$.