

Math 325. Group Quiz #10f

(1) State the *Extreme Value Theorem*.

(2) TRUE OR FALSE, and *justify*:

The function

$$f(x) = \begin{cases} -x & \text{if } x \geq 0 \\ -x + x^2 & \text{if } x < 0 \end{cases}$$

is differentiable at $x = 0$.

(3) TRUE OR FALSE, and *justify* with a short proof or example:

There is a continuous function $f : [1, 3] \rightarrow \mathbb{R}$ with range $[-1, -\frac{1}{2}] \cup [\frac{1}{2}, 2]$.