

Name:

Warm-up #13

Let  $f$  be defined on  $[a, b]$ . Suppose  $f$  is differentiable at  $x \in (a, b)$  and  $f$  has a maximum at  $x$ . Show that  $f'(x) = 0$  by showing that

$$\lim_{h \rightarrow 0^+} \frac{f(x+h) - f(x)}{h} \leq 0$$

and

$$\lim_{h \rightarrow 0^-} \frac{f(x+h) - f(x)}{h} \geq 0.$$