MATH 241: ANALYSIS IN SEVERAL REAL VARIABLES I
IN CLASS REVIEW, EXAM #2

Problem 1. Mark each as true or false. Briefly justify your answer.

(a) If f and $f + g$ are continuous on A then g is continuous on A.

(b) If f and fg are continuous on A then g is continuous on A.

(c) If f is differentiable on (a, b), and $c \in (a, b)$ satisfies $f'(c) = 0$, then $f(c)$ is either the maximum or minimum of f on (a, b).

(d) If a set has a maximum and a minimum, then it is compact.

(e) The empty set $\emptyset$ is compact.

Problem 2. Show that $f(x) = \sqrt{x}$ is uniformly continuous on $[1, \infty)$.

Problem 3. Prove that the only subsets of $\mathbb{R}$ which are both open and closed are $\mathbb{R}$ and $\emptyset$. *[Hint: Use that $\mathbb{R}$ is connected.]*