Fake Quiz 4 Real Analysis 1 11/22/2002

Each problem is worth 0 points, this time at least.

1. What does it mean for a function to be continuous on a set E, as opposed to just continuous at a point a?

2. Give an example of a function $f:\mathbb{R}\to\mathbb{R}$ for which the limit as a approaches 3 does not exist.

3. Give an example of a function for which $\lim_{x\to\infty} f(x)$ is infinite, but $\lim_{x\to\infty} f'(x)$ is finite.

4. State the Extreme Value Theorem.

5. Prove or give a counterexample: If $f'(3)=5$, then $f'(-3)=-5$.

6. Prove or give a counterexample: If $f'(3)=5$ and $f'(-3)=-5$, then f is even.

7. Is it true that every function which is differentiable is twice differentiable?

8. Prove or give a counterexample: If $I=[a,b]$ is an interval and $f:I\to\mathbb{R}$ is an increasing function, then the point a is an absolute minimum for f on I.

9. Show that if f and g are increasing functions on an interval $I\subseteq\mathbb{R}$, then f+g is an increasing function on I as well.

10. Show that $f(x)=\sqrt[3]{x}$ is not differentiable at x=0.