Analysis 1
Quiz 8

Name:_____

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. What theorems of topology are used to prove that the continuous image of a closed bounded interval is a closed bounded interval?

   (a) The continuous image of a compact set is compact.
   (b) The compact subsets of $\mathbb{R}$ are the closed, bounded sets.
   (c) The continuous image of a connected set is connected.
   (d) The connected subsets of $\mathbb{R}$ are the intervals.

2. Write down a formal sentence that expresses "$f : \mathbb{R} \to \mathbb{R}$ is differentiable at $x = c$".

$$(\exists L)(\forall \varepsilon > 0)(\exists \delta > 0)(\forall x)\left((0 < |x - c| < \delta) \to \left(\left| \frac{f(x) - f(c)}{x - c} - L \right| < \varepsilon \right) \right)$$