Homework #3

Reminder: Midterm #1 is on Wednesday 2/6.

1. Suppose that \( f : (a, b) \rightarrow \mathbb{R} \) is differentiable at all points of its domain. Prove that if \( f'(x) = 0 \) for all \( x \in (a, b) \) then \( f \) is a constant function.

2. Suppose that \( f, g : \mathbb{R} \rightarrow \mathbb{R} \) are such that \( f \) is differentiable at the point \( x = a \) but \( g \) is not. Prove or disprove: \( f + g \) is differentiable at the point \( x = a \).