Write your name and code on the back.

Show your work!

1. { 10 points } **Let** $f : \mathbb{R} \to \mathbb{R}$ **and let** $f(x) < 0$ **for all** $x \in \mathbb{R}$**. Prove that** $f(x)$ **is strictly increasing if and only if the function** $g(x) = \frac{1}{f(x)}$ **is strictly decreasing.**