

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be a continuous function. A point x is called a *shadow point* if there exists a point $y \in \mathbb{R}$ with $y > x$ such that $f(y) > f(x)$. Let $a < b$ be real numbers and suppose that

- all the points of the open interval $I = (a, b)$ are shadow points;
- a and b are not shadow points.

Prove that

- a) $f(x) \leq f(b)$ for all $a < x < b$;
- b) $f(a) = f(b)$.