

Proving f is 1 – 1

Case 1: $a, b \geq 0$.

Then $[f(a) = f(b)] \rightarrow [2a = 2b] \rightarrow [a = b]$.

Case 2: $a, b < 0$.

Then $[f(a) = f(b)] \rightarrow [2|a| - 1 = 2|b| - 1] \rightarrow [|a| = |b|]$

If both a, b are negative, then $[|a| = |b|] \rightarrow [a = b]$.

If $a = 0$ then $|a| = 0$ and so $b = 0$ (and similarly for the case where $b = 0$).

Hence $[f(a) = f(b)] \rightarrow [a = b]$ and so f is 1 – 1.