Let be $g(x) = f(x) - x$. g(x) is a continous function in R and never get the value zero.From the Bolzano teorem, we can affirm that g(x) is always positive or always negative. Let suppose g(x)>0. Then f(x)>x $\forall\, x \in \mathbb{R}$. (1)

Let suppose that $a \in \mathbb{R}$ is a solution of f(f(x))=x.Let see that it can´t be possible.

From (1), f(f(a))>f(a), but f(a)>a from (1) again, so f(f(a))>f(a)>a and f(f(a))$\neq$ f(a)

If we had supposed g(x) were negative, we would get the same result.