Let $f: X \to X$ be continuous. Show that if $X = [0,1]$, there is a point x s.t $f(x) = x$. The point x is called a fixed point of f. What happens if $X = (0,1)$ or $[0,1)$?

$g(x) = f(x) - x$. if $g = 0$ we are done

$g(0) \geq 0$, $g(1) \leq 0$ so $g(x) = f(x) - x = 0$ for some x.

Does not work for the other two example

(for $(0,1)$ let $f(x) = \frac{x}{2}$)

(for $[0,1)$ let $f(x) = 1 - e^{-(x+1)}$)

$e^{-(x+1)} < 1 - x$ and $x = 1 - (1-x)$