Assignment 3: Due Thurs Sept 7th

Prove without a calculator, graph, or software that there is a real number that is exactly 1 less than its fifth power. (You need not calculate this number, only prove that it exists.)

$x^5 - 1 = x$ Poly cont.

$x^5 - x - 1 = 0$

$f(0) = -1$

$f(2) = 2^5 - 3$

$f(2) = 29$

let $a = 0$

$b = 2$

Since the func. is a poly. $f(x)$ is cont. (Thrm 7.). To find a value such that $f(x) = 0$ we pick a closed int. $[a,b]$ where $f(a) < 0$ $f(b)$ (Thrm b)

So if $f(a) = 0$ and $f(b) = 29$ there must be a val. X on the int. $[a,b]$ ... $([a,2])$ where $f(x) = 0$ □