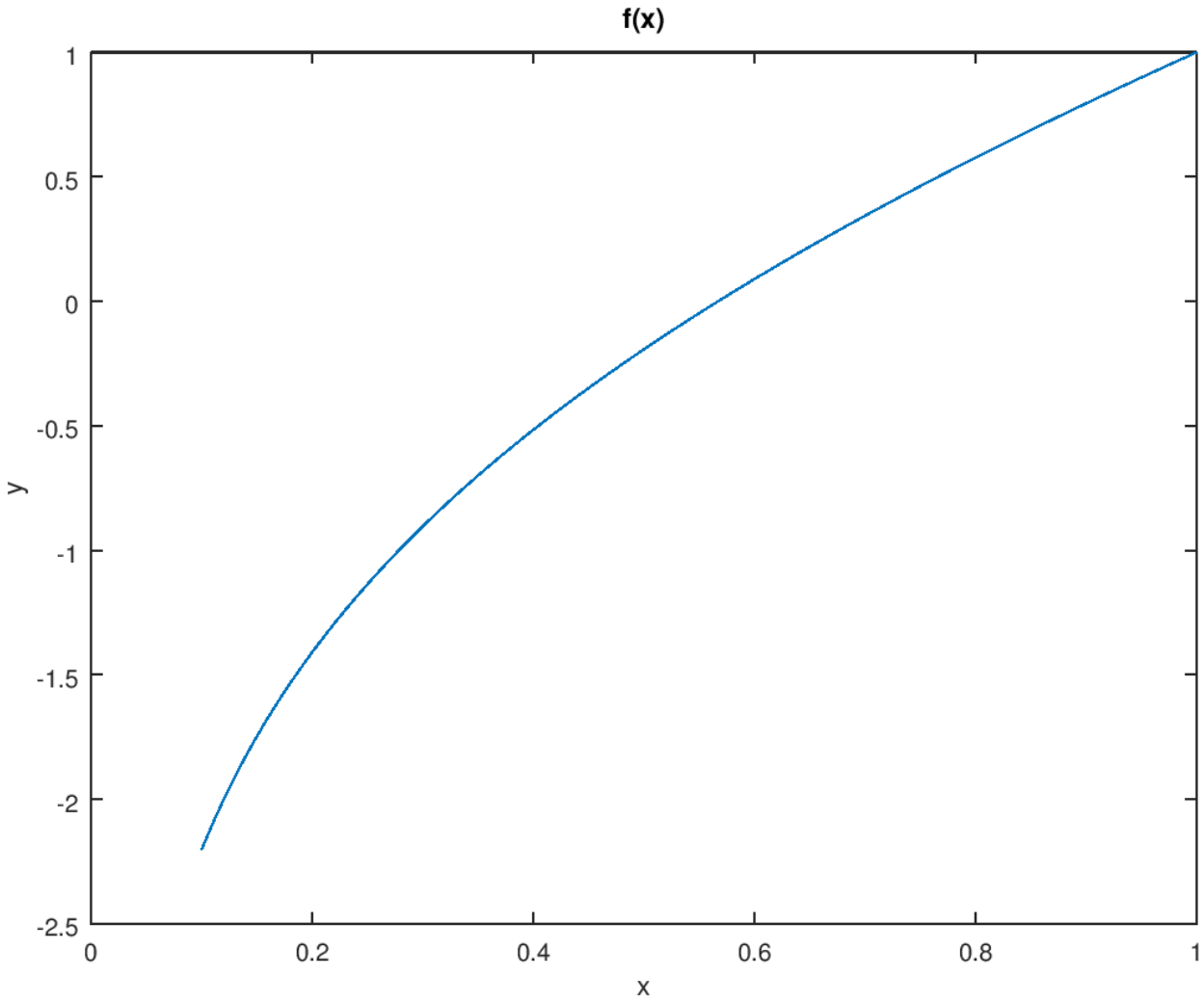
CPSC 302 - Assignment 2

Tristan Rice, q7w9a, 25886145

1

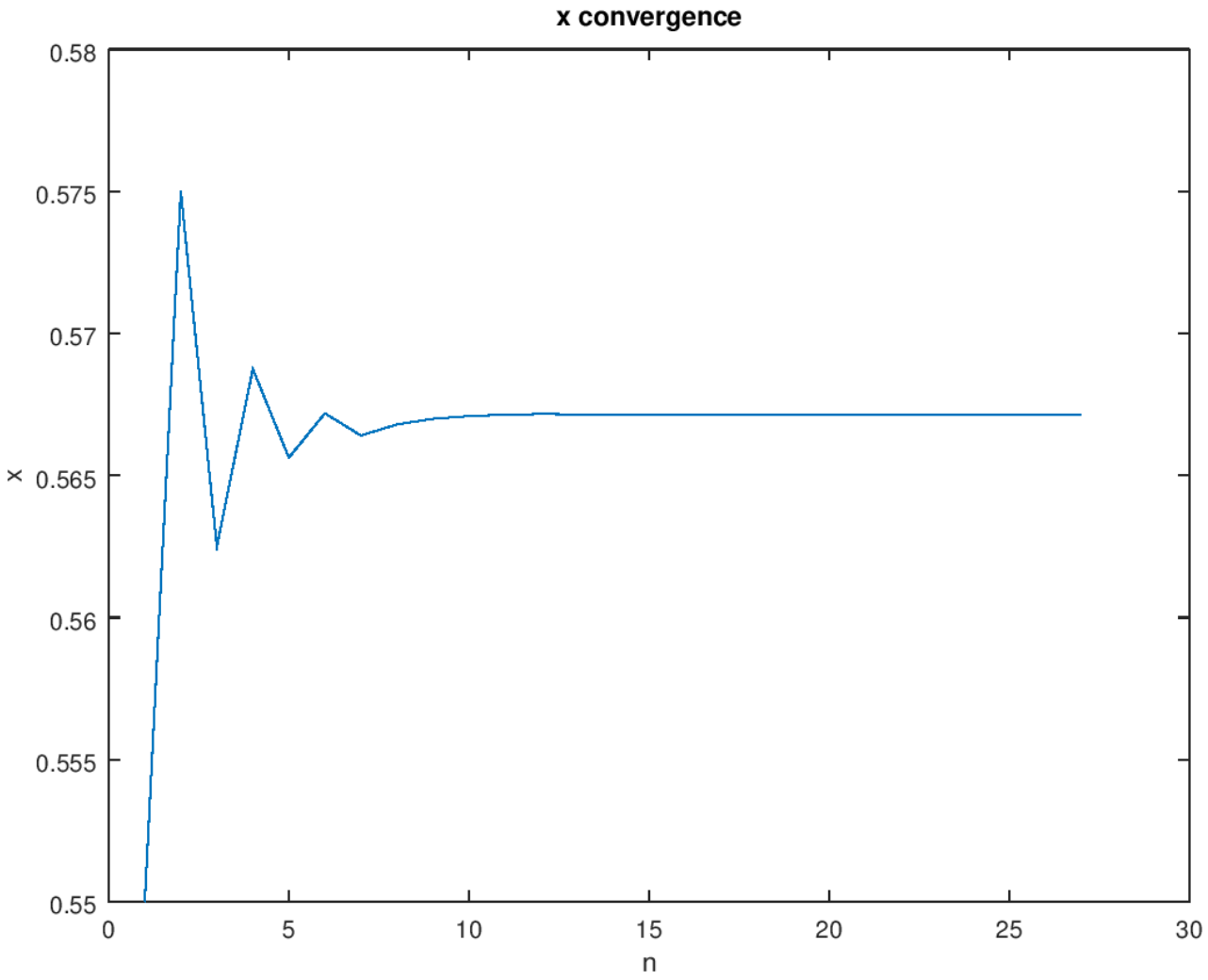
1.a



1.b

1.b.i

This is valid since the function is continuous on the interval, and one side is less than 0 and one side greater. Thus, bisection works just fine.



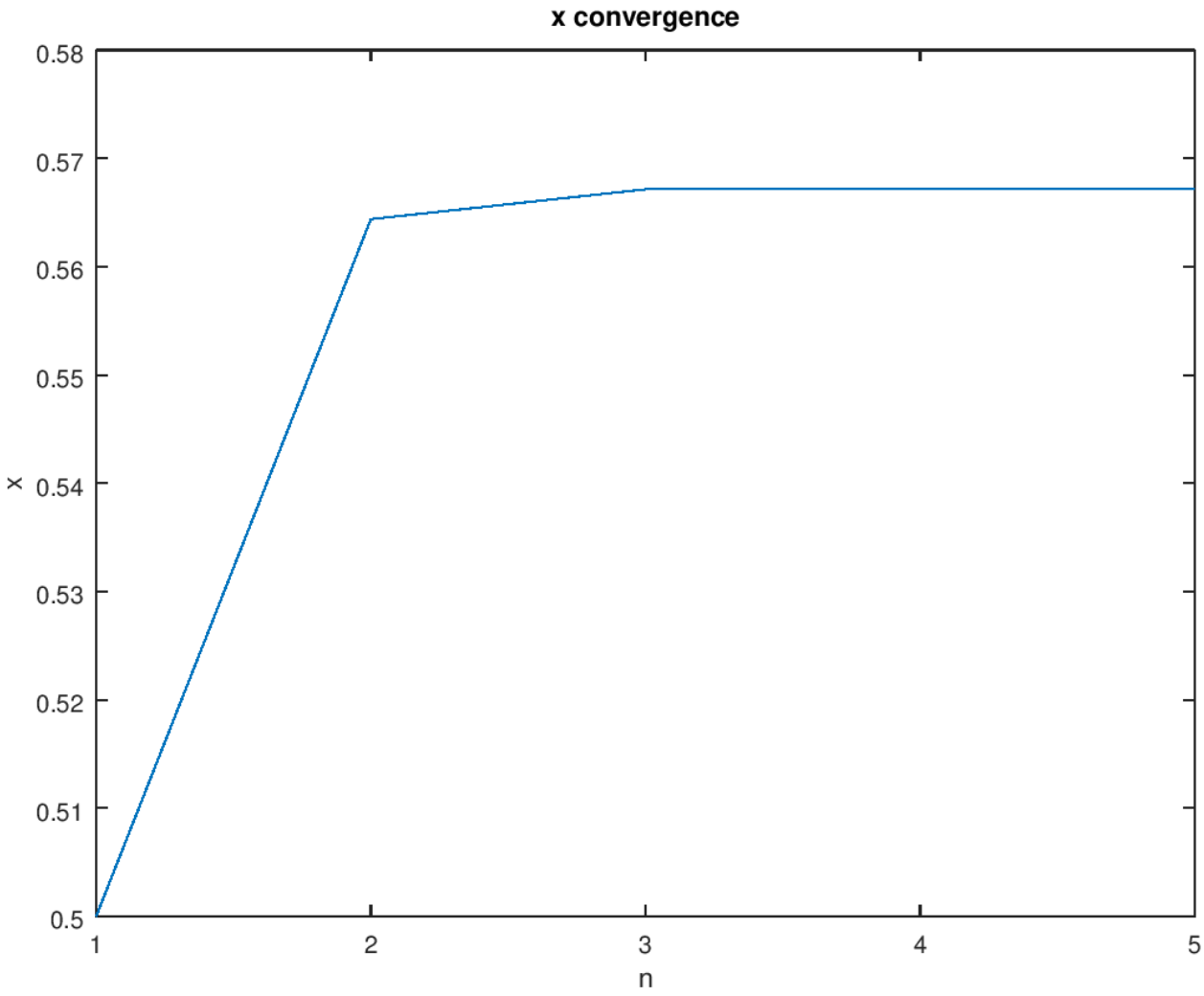
1.b.ii

Existence:

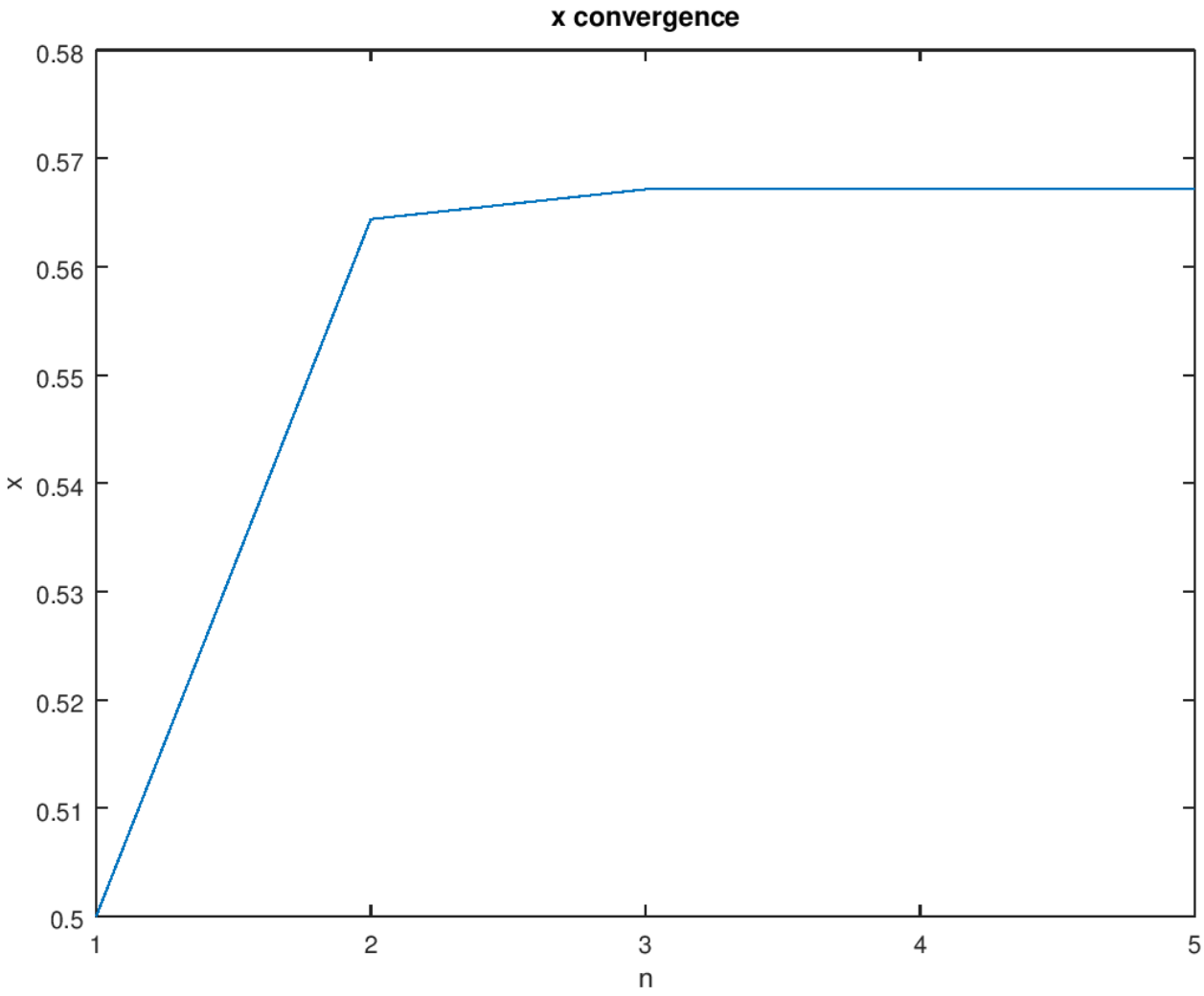
- $g(0.5) = 0.56438 \geq 0.5$
- $g(0.6) = 0.56656 \leq 0.6$

Uniqueness: The derivative $g'(x) = \frac{x+\log x}{(x+1)^2}$ exists and there is a constant $\rho < 1$ between $0.5, 0.6$.

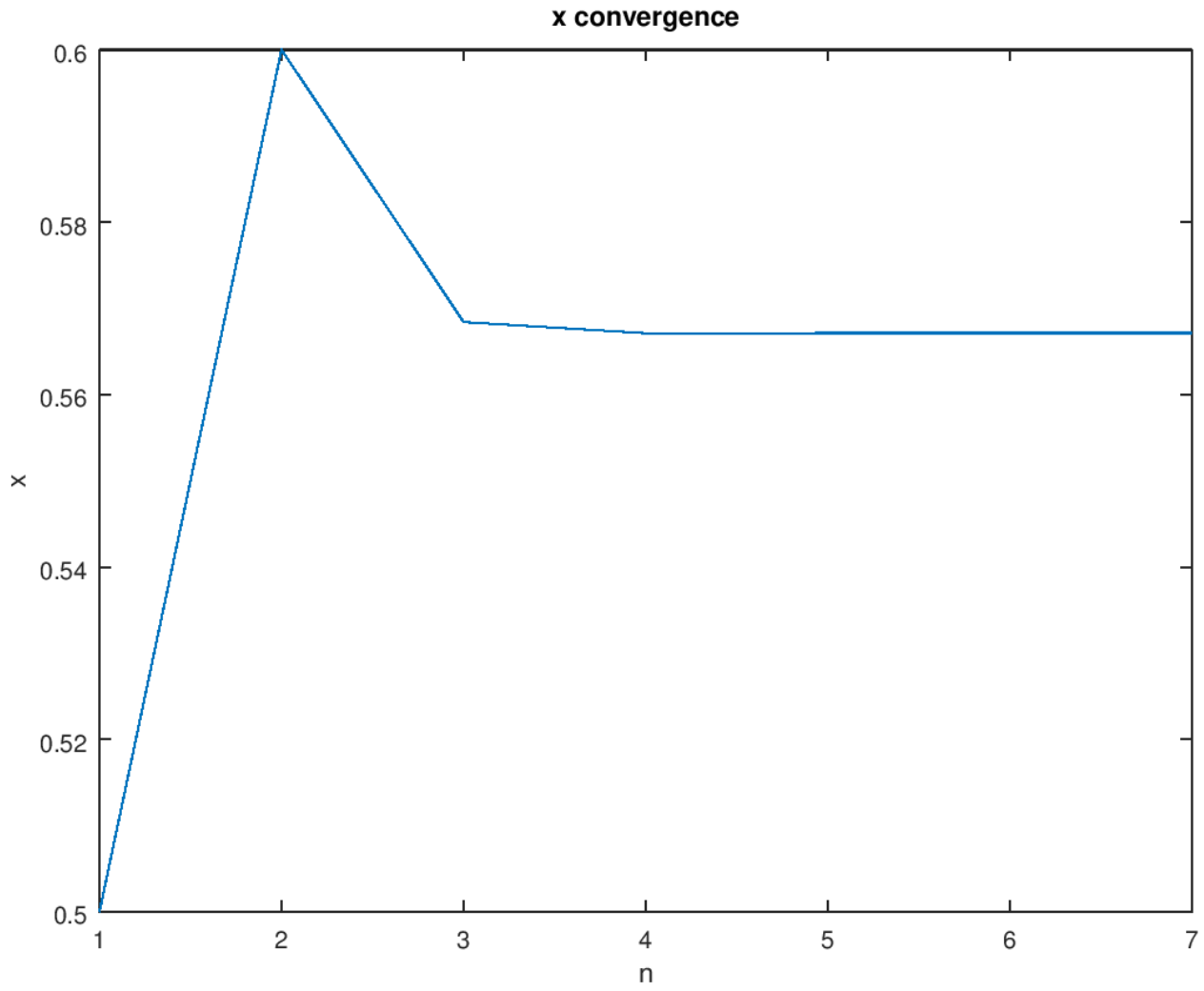
Thus, the fixed point theorem holds and there is only one fixed point in the range $[0.5, 0.6]$.



1.b.iii



1.b.iiii



2

2.a

2.b

2.c

3

3.a

3.b

3.c

4

4.a

4.b