

2
b

$$x_{n+1} = g(x) \longrightarrow g(1.6) = 3.6 \longrightarrow \text{for } x_0 = 1.6$$

$$\alpha = 3^{1/3}$$

$g(x)$ DOESN'T MAP FOR
 x NEAR α , ON
 $g(x)$ NEAR $g(\alpha) \dots$
BUT THIS DOESN'T
PROVE

$$\{x_n\} \not\rightarrow \alpha$$

FOR x_n NEAR α

... IF $x \in [1.0, 2.0]$,
IS $g(x) \in [1.0, 2.0]$?

(SEE 2b.PY)

x_n	$x_{n+1} \approx$
1.0	1.67
2.0	1.59

} ALL $x \in [1.0, 2.0]$
GIVE
 $g(x) \in$

$$\text{IF } |g'(x)| \leq k < 1 \text{ FOR } \forall x \in [1.0, 2.0]?$$

$$g'(x) = \frac{2}{3} - 2/x^3$$

x_n	$ g'(x_n) $
1.0	1.3
2.0	0.42
1.3	0.24

} $\alpha = 3^{1/3}$ IS UNIQUE
FIXED POINT
FOR $\forall x \in [1.3, 2.0]$
 $\rightarrow \{x_n\}$ CONVERGES
TO α IF
 $x_0 \in [1.3, 2.0]$