2

a

$$x_{n+1} = -16 + 6x_n + 12\frac{1}{x_n}, \qquad \alpha = 2$$

DOES $g(x)$ MAP $[a,b]$ W/IN $[a,b]$?

ASSUME $\in [1,3]$ IS 'NEAR α'

$$x_{n+1} = -16 + 6(3) + 12\frac{1}{(3)}$$

$$= -16 + 18 + 4$$

$$= 6 > 3 \longrightarrow$$

$g(x)$ DOES NOT MAP ALL $x \in [1,3]$ ON $[1,3]$, SO $\{x_n\}$ DOES NOT CONVERGE TO $\alpha = 2$

BUT WHAT IF $p_1 = 2.01$

$$x_{n+1} = -16 + 6(2.01) + 12\frac{1}{(2.01)}$$

$$= 2.0 \ldots$$

j $p_1 = 2.1$

$$x_{n+1} = -16 + 6(2.1) + 12\frac{1}{(2.1)}$$

$$= 2.3$$

EVEN IF $[a,b]$ IS $[1.99, 2.01]$ $g(x)$ DOESN'T MAP $[a,b]$ ON $[a,b]$ SO $\{x_n\}$ DIVERGES