2.b

$$x_{n+1} = \frac{2}{3}x_n + \frac{1}{x_n^2}, \qquad \alpha = 3^{1/3}$$

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

$$|g'(\alpha)| = \frac{2}{3} - \frac{2}{3} = 0 \longrightarrow \text{CONVERGENCE}$$

$$|g''(\alpha)| = \left| \frac{6}{3^{4/3}} \right| \approx 1.387 > 0 \longrightarrow \text{QUADRATIC CONVERGENCE}$$