EX.1.5.7, Sauer3

Consider the following four methods for calculating $2^{1/4}$, the fourth root of 2.

  (i) Bisection Method applied to $f(x) = x^4 - 2$

  (ii) Secant Method applied to $f(x) = x^4 - 2$

  (iii) Fixed Point Iteration applied to $g(x) = \frac{x}{2} + \frac{1}{x^3}$

  (iv) Fixed Point Iteration applied to $g(x) = \frac{x}{3} + \frac{1}{3x^3}$

For each of these methods,

  a. Determine the speed of convergence

  b. Are there any methods that will converge faster than all the above methods? If so, name it.