Information

$$f(x) = \ln(1+x) \Rightarrow f^{(n)}(x) = (-1)^{n+1}\frac{(n-1)!}{(1+x)^n}$$

$$f(x) = \sum_{n=0}^{\infty} \frac{f^{(n)}(x_0)}{n!}(x-x_0)^n$$

$$R_n(x) = \frac{(x-x_0)^{n+1}}{(n+1)!} f^{(n+1)}(\xi), \quad x_0 < \xi < x$$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$$x_{n+1} = \frac{x_{n-1}y_n - x_n y_{n-1}}{y_n - y_{n-1}}$$

For $x_{i+1} = g(x_i)$, convergence is guaranteed whenever

$$|g'(x)| < 1$$

for x in the neighbourhood of the root of f, where $f(x) = x - g(x)$.