$$|p_n - p| = \left(\frac{2}{3}\right)^n \cdot \frac{1}{2} < 10^{-4}$$

$$\left(\frac{2}{3}\right)^n < \frac{2}{10^4}$$

$$n \ln \frac{2}{3} < \ln \frac{2}{10^4}$$

$$n \geq \frac{\ln \frac{2}{10^4}}{\ln \frac{2}{3}}$$

Ex. For the approximate solution of the equation

$$(x-2)^2 - \ln x = 0 \quad \text{for } 1 \leq x \leq 2$$

set up

(a) Newton's Method
(b) Secant Method
(c) Method of false position.

Formulas:

$$p_n = p_{n-1} - \frac{f(p_{n-1})}{f'(p_{n-1})}$$

$$p_n = p_{n-1} - \frac{f(p_{n-1})(p_{n-1} - p_{n-2})}{f(p_{n-1}) - f(p_{n-2})}$$

$$p_n = p_{n-1} - \frac{p_{n-1} - p_0}{f(p_{n-1}) - f(p_0)} f(p_{n-1})$$