Derivation Method of false position

$$\frac{f(x_1)}{x_n - x_1} = \frac{f(x_0)}{x_{rc} - x_0}$$

$$\Rightarrow (x_n - x_0) f(x_1) = (x_{rc} - x_1) f(x_0)$$

$$\Rightarrow x_{rc} f(x_1) - x_0 f(x_1) = x_{rc} f(x_0) - x_1 f(x_0)$$

$$\Rightarrow x_{rc} f(x_1) - x_{rc} f(x_0) = x_0 f(x_1) - x_1 f(x_0)$$

$$\Rightarrow x_{rc} \{ f(x_1) - f(x_0) \} = x_0 f(x_1) - x_1 f(x_0)$$

$$\Rightarrow x_{rc} = \frac{x_0 f(x_1) - x_1 f(x_0)}{f(x_1) - f(x_0)}$$

$$= \frac{x_0 f(x_1)}{f(x_1) - f(x_0)} - \frac{x_1 f(x_0)}{f(x_1) - f(x_0)}$$

$$= \frac{x_0 f(x_1)}{f(x_1) - f(x_0)} - \frac{x_1 f(x_0)}{f(x_1) - f(x_0)} + x_0 - x_0$$

$$\Rightarrow x_{rc} = \frac{x_0 f(x_1)}{f(x_1) - f(x_0)} - x_0 - \frac{x_1 f(x_0)}{f(x_1) - f(x_0)} + x_0$$

$$= \frac{x_0 f(x_1) - x_0 f(x_1) + x_1 f(x_0)}{f(x_1) - f(x_0)} - \frac{x_1 f(x_0)}{f(x_1) - f(x_0)} + x_0$$

$$= \frac{x_0 f(x_0)}{f(x_1) - f(x_0)} - \frac{x_1 f(x_0)}{f(x_1) - f(x_0)} + x_0$$

$$= \frac{x_0 f(x_0) - x_1 f(x_0)}{f(x_1) - f(x_0)} + x_0$$

$$x_2 = x_0 - \frac{f(x_0)(x_0 - x_1)}{f(x_1) - f(x_0)}$$