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

$$f(x_n) + f'(x_n)(x_{n+1} - x_n) + g(x_n) = 0,$$
$$g(x_{n+1}) = f(x_{n+1}) - f(x_n) + f'(x_n)(x_{n+1} - x_n).$$

$$f(x_0) + f'(x_0)(x - x_0) + \frac{1}{2}f''(x_0)(x - x_0)^2 + g(x) = 0,$$
$$g(x) = f(x) - f(x_0) - f'(x_0)(x - x_0) - \frac{1}{2}f''(x_0)(x - x_0)^2.$$