

Phys 20 Lab 6 - Root Finding

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1 Part 1 - Golden Ratio Convergence of Secant Method

Within a small distance ϵ of x , the function is approximately:

$$f(x + \epsilon) = f(x) + \epsilon f'(x) + \epsilon^2 \frac{f''(x)}{2} + \dots$$

Evaluating at x_1 and x_2 and plugging into the step relation for the Secant Method

$$f(x_3) = x_2 - f(x_2) \frac{x_2 - x_1}{f(x_2) - f(x_1)}$$

we get the following:

2 Code and Info