

2.2 Root Finding

2.3 Newton's Method

Given a function $f(x)$ which is once continuously differentiable and its derivative $f'(x)$ is inexpensive to evaluate, we would use **Newton's Method** to numerically find the root of $f(x)$.

2.3.A Fixed Point Method

Given a function $f(x)$ which is Lipschitz continuous with constant $0L < 1$, we would use the **Fixed Point Method** to numerically find the root of $f(x)$.

2.3.B Bisection Method

Given a function $f(x)$ which is once continuously differentiable and its derivative $f'(x)$ is expensive to evaluate, we would use the **Bisection Method** to numerically find its root as computing the derivative is not required for the Bisection Method to find the root of $f(x)$.

2.3.C Bisection Method

Given a function $f(x)$ which is continuous but not differentiable, we would use the **Bisection Method** to numerically find its root, as once again, computing the derivative of $f(x)$ is not required for the Bisection Method to find the root of $f(x)$.