Newton's Method

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Newton's Method/Newton-Raphson Method

Newton's method, also known as Newton-Raphson method, is an iterative technique used to approximate the roots of a real-valued function. Given a function $f(x)$ and an initial guess x_0 close to a root, Newton's method refines this guess by repeatedly applying the formula:

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}, \, n \in \mathbb{N}$$

where:

- x_n is the current approximation,
- $f(x_n)$ is the value of the function at x_n,
- $f'(x_n)$ is the derivative of $f(x)$ evaluated at x_n.