

Section 4.9 *Newton's method***Learning outcomes**

After completing this section, you will inshaAllah be able to

1. use [Newton's method to approximate roots](#) of a function $f(x)$

Newton's method for approximating roots of $f(x)$

Purpose of Method

- To approximate solutions of $f(x) = 0$ starting with an initial approximation x_1 of the solution.

Main Idea

- Start with initial approximation x_1 .
- Use zero of tangent line at $(x_1, f(x_1))$ to get next approximation x_2 .
- Carry on up to desired level of accuracy.

See class
explanation

Newton's Method

If

- x_n is an approximation to $f(x) = 0$
- and
- $f'(x_n) \neq 0$



then the next approximation is given by

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

See examples 1, 2 done in class

End of 4.9