

Visualizing a derivative using Geogebra

Abstract:

Understanding derivatives is a fundamental concept in calculus, but many learners struggle to intuitively grasp its geometric significance. This project aims to leverage Geogebra to create an interactive tool that helps visualize and understand the derivative $f'(x)$ as the slope of the function $f(x)$ at a given point $x=a$.

The tool will feature a zoom widget integrated with a graphing interface. Users can select any point $x=a$ on the curve and gradually zoom into the point $(a, f(a))$, observing how the curve locally resembles a straight line. This visualization reinforces the idea that as the zoom level increases, the slope of this straight line converges to $f'(a)$.

This project offers an intuitive and interactive way to explore the concept of derivatives, and for learners to self discover the limit definition of a derivative!