

Name _____

Unveiling the Core: Exploring the Fundamental Theorem of Calculus

Open-Ended Response Answer Key

1. The fundamental theorem of calculus shows how differentiation and integration are connected. It states that the definite integral of a function is equal to the antiderivative of the function evaluated at the endpoints of the interval.
2. It enables us to solve a wide range of problems in physics, engineering, economics, and other fields by providing a unified framework for understanding rates of change, calculating areas and volumes, and solving differential equations.
3. It forms the backbone of calculus by establishing the connection between two fundamental operations and providing a powerful tool for solving problems in mathematics and science.
4. For example, in physics, the fundamental theorem of calculus is used to calculate the work done by a varying force or the total energy of a system by evaluating the definite integral of a force function over a given interval.

