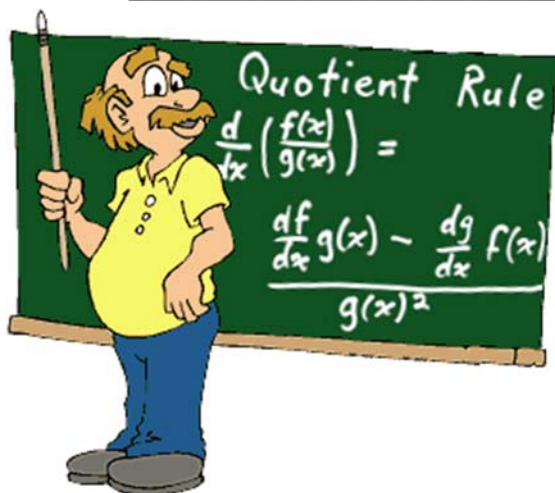


Name _____



Decoding Derivatives: Unveiling the Secrets of Functions

Imagine you are a detective, searching for clues to unravel a mystery. In the world of mathematics, finding the derivative of a function is like discovering hidden clues that reveal how the function behaves. But what exactly does the derivative tell us, and how do we find it?

The derivative of a function provides us with crucial information about how the function is changing at any given point. It tells us the rate at which the function is increasing or decreasing, similar to how a speedometer tells us how fast a car is moving. For example, if we have a function that represents the height of a bouncing ball over time, the derivative of that function tells us how quickly the ball is moving upward or downward at any moment.

So, how do we find the derivative of a function? It's like solving a puzzle, where each piece fits together to reveal the bigger picture. One method for finding derivatives is called the "power rule," which applies to functions raised to a power. For instance, if we have a function $f(x) = x^2$, the power rule tells us that the derivative of $f(x)$ is $2x$. This means that at any point on the graph of $f(x)$, the slope of the tangent line is twice the x -coordinate.

Another method is called the "product rule," which is used when dealing with the product of two functions. Imagine you have a function that represents the area of a rectangle, where one side is changing with respect to time. The product rule helps us find the rate at which the area is changing as both sides of the rectangle are changing.

Additionally, there's the "chain rule," which is like peeling off layers of an onion to get to the core. It's used when functions are nested within each other, like when taking the sine of a square root. The chain rule allows us to find the derivative of the outer function multiplied by the derivative of the inner function.

To summarize, the derivative of a function tells us how the function is changing, whether it's increasing or decreasing, and at what rate. And to find it, we use various rules and techniques, like the power rule, product rule, and chain rule, to decode the mysteries hidden within the function's behavior.

