MATHEMATICS

CALCULUS APPLICATIONS: DERIVATIVES

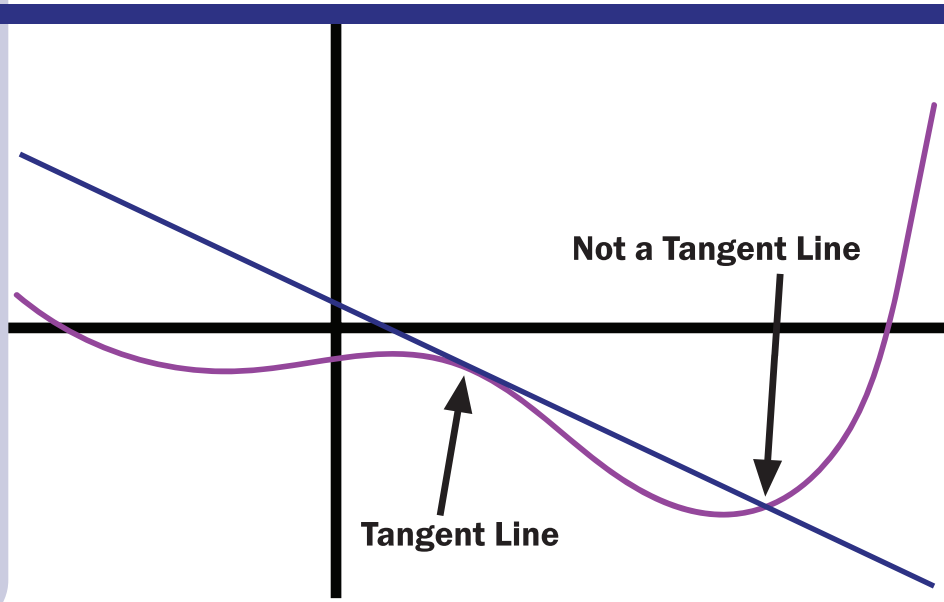
CONCEPT The derivative of a function represents the instantaneous rate of change of the function. In other words, it is the slope of a function, even when that function is curved.

BACKGROUND

DERIVATIVE: the instantaneous slope of a function.

TANGENT LINE: a line that intersects a curve at exactly one place.

Isaac Newton and Gottfried Leibniz both independently discovered the key principles of Calculus in the late 1600's. Their work has laid the foundation for much of modern mathematics, and without their work, much of modern technology would be impossible.



REAL WORLD CONNECTIONS

The derivative represents the rate of change of one variable with respect to another, and while that may seem abstract, many common phenomena can be related with derivatives. Velocity is the rate distance changes with time. (Example: If you drive 120 miles in 2 hours, you were going 60 mph). This is just a derivative. Velocity is the derivative of position with respect to time. If you know an equation which gives position as a function of time, the derivative will give you the velocity as a function of time.