

14 Lecture - MTH101

Important Subjective

What is a tangent line and how is it used in calculus?

Answer: A tangent line is a straight line that touches a curve at a single point and is used to approximate the behavior of the curve near that point. In calculus, we use the tangent line to find the derivative of a function at a specific point.

What is the derivative of a function and how is it related to the tangent line?

Answer: The derivative of a function gives us the instantaneous rate of change of the function at a specific point, which is the slope of the tangent line. The tangent line is used to approximate the behavior of the curve near that point.

How do you find the equation of a tangent line at a specific point?

Answer: To find the equation of the tangent line at a specific point, we need to find the derivative of the function at that point, which gives us the slope of the tangent line. Then, we use the point-slope formula to find the equation of the tangent line.

What is the average rate of change of a function over an interval?

Answer: The average rate of change of a function over an interval is the amount by which the function changes with respect to its independent variable, divided by the length of the interval.

What is the instantaneous rate of change of a function at a specific point?

Answer: The instantaneous rate of change of a function at a specific point is the derivative of the function at that point, which gives us the slope of the tangent line at that point.

How are tangent lines and rates of change used in physics?

Answer: Tangent lines and rates of change are used in physics to find the velocity, acceleration, and other parameters of an object's motion.

How are tangent lines and rates of change used in economics?

Answer: Tangent lines and rates of change are used in economics to find the marginal rate of change of a function, which is the rate at which certain parameter changes with respect to another parameter.

What is the relationship between the slope of the tangent line and the slope of the curve at a specific point?

Answer: The slope of the tangent line to a curve at a specific point is equal to the slope of the curve at that point.

How can we use the tangent line to approximate the behavior of a curve near a specific point?

Answer: By finding the equation of the tangent line at a specific point, we can approximate the behavior of the curve near that point. The tangent line gives us a linear approximation of the curve at that point.

What are some real-world applications of tangent lines and rates of change?

Answer: Tangent lines and rates of change have many real-world applications, such as in physics, economics, engineering, and finance. They are used to model and analyze the behavior of various systems and processes.