

13 Lecture - MTH101

Important Subjective

What is the definition of the sine function?

Answer: The sine function is defined as the y-coordinate of a point on the unit circle in the coordinate plane.

Is the limit of the sine function as x approaches zero defined? Why or why not?

Answer: No, the limit of the sine function as x approaches zero is not defined because the function oscillates between -1 and 1 as x approaches zero.

What is the limit of the cosine function as x approaches zero?

Answer: The limit of the cosine function as x approaches zero is 1.

What is the definition of continuity?

Answer: A function is said to be continuous at a point if the limit of the function at that point exists and is equal to the value of the function at that point.

Is the tangent function continuous at all points? Why or why not?

Answer: No, the tangent function is not continuous at certain points where it has vertical asymptotes.

What is the derivative of the sine function?

Answer: The derivative of the sine function is the cosine function.

What is the derivative of the cosine function?

Answer: The derivative of the cosine function is the negative sine function.

What is the derivative of the tangent function?

Answer: The derivative of the tangent function is the secant squared function.

How can the continuity of trigonometric functions be used to solve problems in calculus?

Answer: The continuity of trigonometric functions can be used to find critical points and solve optimization problems.

What is the maximum value of the function $f(x) = \sin(x) + \cos(x)$ on the interval $[0, 2\pi]$?

Answer: The maximum value of the function $f(x) = \sin(x) + \cos(x)$ on the interval $[0, 2\pi]$ is $\sqrt{2}$, which occurs at $x = \pi/4$ and $5\pi/4$.