

36 Lecture - MTH101

Important Subjective

What is a plane curve?

A plane curve is a two-dimensional curve that can be described by a function of two variables, usually denoted by x and y .

What is the length of a plane curve?

The length of a plane curve is the distance between its endpoints.

How do we calculate the length of a curve?

To calculate the length of a curve, we use the arc length formula, which involves integrating the square root of the sum of the squares of the derivatives of the curve.

What is arc length?

Arc length is the length of a small section of a curve, defined as the distance between two points on the curve that are very close together.

What is the formula for arc length?

The formula for arc length is $L = \int_a^b \sqrt{1 + (dy/dx)^2} dx$, where dy/dx is the derivative of y with respect to x , and the integral is taken over the interval $[a,b]$.

What is the difference between a smooth curve and a non-smooth curve?

A smooth curve is a curve that has a continuous and differentiable derivative, while a non-smooth curve is a curve that does not have a continuous and differentiable derivative.

Can we use the arc length formula for non-smooth curves?

For non-smooth curves, we can divide the curve into small sections and approximate its length using the arc length formula for each section.

How do we find the length of a circle?

The length of a circle is called its circumference, which is given by the formula $C = 2\pi r$, where r is the radius of the circle.

How do we find the length of an ellipse?

The length of an ellipse is not given by a simple formula, but it can be approximated using numerical methods.

Can we use numerical methods to approximate the length of any curve?

Yes, numerical methods such as Simpson's rule or the trapezoidal rule can be used to approximate the length of any curve, even if the arc length formula is difficult or impossible to solve analytically.