CSC232 - Lecture X

[Lesson Topic(s)]

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Prepared for [Month Day, Year]

Lecture Title

> **Note**
>
> This template is designed for MAT232 lecture notes. Replace this content with your specific lecture details.

Key Concepts

> **Definition**
>
> A **parametric equation** is a set of equations that express the coordinates of the points of a curve as functions of a variable, called a parameter.

Examples

> **Example**
>
> **Example 1:** Consider the parametric equations:
>
> $$x = t, \quad y = t^2, \quad t \in \mathbb{R}.$$
>
> - At $t = 0$, $(x, y) = (0, 0)$.
>
> - At $t = 1$, $(x, y) = (1, 1)$.
>
> This describes a parabola.

Theorems and Proofs

> **Theorem**
>
> **Theorem:** If $x(t)$ and $y(t)$ are differentiable functions, the slope of the curve is given by:
>
> $$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}, \quad \text{provided } \frac{dx}{dt} \neq 0.$$

Additional Notes

> **Note**
>
> Always check the domain of the parameter t when solving problems involving parametric equations.