1 1.3: Vector Functions and Parametrized Curves

Definitions:
(Recall) function:

Vector Valued function:

Parametrized Curve:

Eliminating the Parameter

Vector and Parametric Equations of a Line
Examples:

Given the curve parametrized by \( \mathbf{r}(t) = (t^2 + 1)i + (t^2 - 1)j \), determine when, if at all, the curve passes through the point (5, 3).

Describe the motion of a particle with position \( \mathbf{r}(t) = < 2 \sin t, 3 \cos t >, 0 \leq t \leq 2\pi \).

Find vector and parametric equations for the line passing through the points \((-3, 4)\) and \((2, 8)\).
On Beyond Average:
Given \( \mathbf{r}(t) = \sin t \mathbf{i} + \cos^2 t \mathbf{j} \), eliminate the parameter to find the Cartesian equation of the curve. Is the point \((2, -3)\) on the curve? Sketch the graph.