

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 $\mathbf{r}(t) = \sin t \mathbf{i} + \cos^2 t \mathbf{j}$, eliminate the parameter to find the Cartesian equation of the curve. Is the point $(2, -3)$ on the curve?

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

Find vector and parametric equations for the line passing through the points $(-3, 4)$ and $(2, 8)$.

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

$$t = 2, t = -2$$