1.3-Vector-Valued Functions and Parametrized Curves

Idea of a Vector Function/Parametrized Curve:

Eliminating the Parameter

Vector and Parametric Equations of a Line

Examples:
Given \( \mathbf{r}(t) = (t^{\frac{1}{2}} + 1)\mathbf{i} + t^{\frac{3}{2}}\mathbf{j} \):

a) Find \( \mathbf{r}(4) \) and \( \mathbf{r}(t + h) \)

b) Eliminate the parameter and sketch the graph
Describe the motion of a particle whose position is given by \( x = -4 \cos t, \ y = 3 \sin t, \ 0 \leq t \leq \pi \)

Find vector and parametric equations of the line passing through the points \((-1, 3)\) and \((5, 2)\)

Eliminate the parameter to sketch the graph of the vector function \( \mathbf{r}(t) = t \mathbf{i} + (t - 1)^3 \mathbf{j} \). Does this graph differ from the first example? How?

On Your Own: #1,3,5,7,9,15,17,25,27,29,31,34,35