

Exercise 1.1.3

In \mathbb{R}^4 , what is the parametrization of the line through $(-1, 6, 5, 0)$ and $(0, 1, -3, 9)$?

Solution

Let the two points be denoted as

$$\begin{aligned}\mathbf{p} &= (-1, 6, 5, 0) \\ \mathbf{q} &= (0, 1, -3, 9).\end{aligned}$$

The parametrization for the line passing through \mathbf{p} and \mathbf{q} is given by

$$\begin{aligned}\alpha(t) &= \mathbf{p} + (\mathbf{q} - \mathbf{p})t \\ \alpha(t) &= (-1, 6, 5, 0) + (1, -5, -8, 9)t \\ \alpha(t) &= (t - 1, 6 - 5t, 5 - 8t, 9t).\end{aligned}$$