Exercise 1.1.2

What is the parametrization of the line through $(-1, 0, 5)$ and $(3, -1, -2)$?

Solution

Let the two points be denoted as

$$\begin{aligned}\mathbf{p} &= (-1, 0, 5)\\ \mathbf{q} &= (3, -1, -2).\end{aligned}$$

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

$$\begin{aligned}\alpha(t) &= \mathbf{p} + (\mathbf{q} - \mathbf{p})t\\ \alpha(t) &= (-1, 0, 5) + (4, -1, -7)t\\ \alpha(t) &= (4t - 1, -t, 5 - 7t).\end{aligned}$$