MATH 20C, SECTION A07   October 14, 2014

Quiz1

1. (10 points) Find a vector parametrization $r(t)$ for the line through $P = (1, -1, 0)$ and $Q = (1, 0, 2)$.

Solution

Let $\overrightarrow{OP}$ *and* $\overrightarrow{OQ}$ *be the position vectors corresponding to the points P & Q respectively.*

$$\vec{r}(t) = \overrightarrow{OP} + t\overrightarrow{PQ}; \quad -\infty < t < \infty$$
$$= \overrightarrow{OP} + t(\overrightarrow{OQ} - \overrightarrow{OP})$$
$$= (1 - t)\overrightarrow{OP} + t\overrightarrow{OQ}$$
$$= (1 - t) <1, -1, 0> + t <1, 0, 2>$$
$$= <1, -1 + t, 2t>$$