

Solutions for Quiz 1, Section A04

Find a vector parametrization $\vec{r}(t)$ for the line through $P = (1, 0, 4)$ and $Q = (3, 2, 5)$.

Solution: We need to find two vectors, one vector whose terminal point is on the line and one vector parallel to the line. The vector $\langle 1, 0, 4 \rangle$ has the terminal point $(1, 0, 4)$, which is on the line. The vector

$$\overrightarrow{PQ} = \langle 3 - 1, 2 - 0, 5 - 4 \rangle = \langle 2, 2, 1 \rangle$$

is parallel to the line. So a parametrization of the line is:

$$\vec{r}(t) = \langle 1, 0, 4 \rangle + t\langle 2, 2, 1 \rangle.$$