

Math 1260 - Quiz 2

Key

1. Find a parametric equation of the line through the points $P = (1, -2, 3)$, and $Q = (4, 5, 6)$.
Now write down a different parameterization of the same line.

$$\vec{v} = \vec{Q} - \vec{P} = \langle 3, 7, 3 \rangle$$

$$\text{Eqn : } \vec{P} + t\vec{v} = \langle 1, -2, 3 \rangle + t\langle 3, 7, 3 \rangle$$

Another : $\vec{P} + (2t)\vec{v}$ which goes at twice
the speed

2. Find all vectors perpendicular to both of the vectors $\mathbf{a} = \mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$ and $\mathbf{b} = -2\mathbf{i} + 2\mathbf{j} - 4\mathbf{k}$.

$$\vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 2 & 3 \\ -2 & 2 & -4 \end{vmatrix} = \langle -14, -2, 6 \rangle$$

so all vectors perp to \vec{a} and \vec{b} are
of the form $t \cdot \langle -14, -2, 6 \rangle$ for some
 $t \in \mathbb{R}$.

