Show that the vectors $\frac{1}{7}(2i+3j+6k)$, $\frac{1}{7}(3i-6j+2k)$ and $\frac{1}{7}(6i+2j+3k)$ are mutually perpendicular.

Let $\vec{a} = \frac{1}{7}(2i+3j+6k)$

$\vec{b} = \frac{1}{7}(3i-6j+2k)$

$\vec{c} = \frac{1}{7}(6i+2j+3k)$

consider $\vec{a} \cdot \vec{b} = \frac{1}{7}(2i+3j+6k) \cdot \frac{1}{7}(3i-6j+2k)$

$= \frac{1}{49}\{(2i+3j+6k) \cdot (3i-6j+2k)\}$

$= \frac{1}{49}\{6-18+12\} = \frac{1}{49}\{0\}$

$\therefore \vec{a} \cdot \vec{b} = 0$ $\therefore \vec{a}$ is perpendicular to $\vec{b}$

$///^{ly}$ We can show that $\vec{b} \cdot \vec{c} = 0$ & $\vec{c} \cdot \vec{a} = 0$

$\therefore \vec{a}, \vec{b}, \vec{c}$ are mutually perpendicular vectors.