1.2.7 Find the vector product of the two vectors defined by $\mathbf{A} = \mathbf{u_x} + \mathbf{u_y} + \mathbf{u_z}$ and $\mathbf{B} = 2\mathbf{u_x} + 4\mathbf{u_y} + 6\mathbf{u_z}$. Check your answer using MATLAB.

The vector product of $\mathbf{A}$ and $\mathbf{B}$ is

$$\begin{aligned}\mathbf{A} \times \mathbf{B} &= (A_y B_z - A_z B_y)\mathbf{u_x} + (A_z B_x - A_x B_z)\mathbf{u_y} + (A_x B_y - A_y B_x)\mathbf{u_z} \\ &= (1 \cdot 6 - 1 \cdot 4)\mathbf{u_x} + (1 \cdot 2 - 1 \cdot 6)\mathbf{u_y} + (1 \cdot 4 - 1 \cdot 2)\mathbf{u_z} \\ &= 2\mathbf{u_x} - 4\mathbf{u_y} + 2\mathbf{u_z}.\end{aligned}$$