* Worksheet 8

Problem 1 : $u_1 = \begin{pmatrix} 3 \\ 4 \\ 0 \end{pmatrix}$ $u_2 = \begin{pmatrix} 4 \\ -3 \\ 0 \end{pmatrix}$ $u_3 = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$

$u_1 \cdot u_2 = 0$ $u_1 \cdot u_3 = 0$ $u_2 \cdot u_3 = 0$ $\Rightarrow$ orthogonal

however $\Rightarrow \|u_1\| = \sqrt{9+16} = 5 \neq 1$ $\|u_2\| = \sqrt{16+9} = 5 \neq 1$

$\Rightarrow$ So u_1, u_2, u_3 are not orthonormal

Problem 2 :

u_1 : First eigen vector u_2 : Second eigen vector