Answer Key of Tutorial 8

1. (i)

Eigenvectors for $\lambda = -2$: $\begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$

Eigenvectors for $\lambda = 4$: $\begin{pmatrix} -1 \\ 0 \\ 1 \end{pmatrix}$

Eigenvectors for $\lambda = 6$: $\begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix}$

(ii)

Eigenvectors for $\lambda = 0.38563\ldots$: $\begin{pmatrix} -0.68591\ldots \\ 0.03577\ldots \\ 1 \end{pmatrix}$

Eigenvectors for $\lambda = -1.31255\ldots$: $\begin{pmatrix} 1.36207\ldots \\ -1.83731\ldots \\ 1 \end{pmatrix}$

Eigenvectors for $\lambda = 5.92692\ldots$: $\begin{pmatrix} 1.54606\ldots \\ 1.69043\ldots \\ 1 \end{pmatrix}$

(iii)

Eigenvectors for $\lambda = -0.88202\ldots$: $\begin{pmatrix} -0.44101\ldots \\ 0.15302\ldots \\ 1 \end{pmatrix}$

Eigenvectors for $\lambda = 1.77653\ldots$: $\begin{pmatrix} 0.88826\ldots \\ -3.97503\ldots \\ 1 \end{pmatrix}$

Eigenvectors for $\lambda = 5.10548\ldots$: $\begin{pmatrix} 2.55274\ldots \\ 0.82201\ldots \\ 1 \end{pmatrix}$

2. Not in T2 exam

3. Not in T2 exam

5. (i) $\lambda \in D_1 \cup D_2 \cup D_3$ where $D_1 = \{z \in C: |z-1| \leq 5.88\}$, $D_2 = \{z \in C: |z+5| \leq 10.388\}$, $D_3 = \{z \in C: |z-6| \leq 7.245\}$ and C is complex plane.

(ii) $\lambda \in D_1 \cup D_2 \cup D_3$ where $D_1 = \{z \in C: |z-1| \leq 3\}$, $D_2 = \{z \in C: |z+5| \leq 4\}$, $D_3 = \{z \in C: |z-4| \leq 5\}$ and C is complex plane.