Q6

1. For any $W \subseteq_{s.s} V$, the orthocomplement of W is denoted $W^{\perp} = \{v \in V : \forall w \in W, \langle v, w \rangle = 0\}$

2. $T : \mathbb{R}^2 \to \mathbb{R}^2$

$[x, y] \mapsto [x - y, -x + y]$

$[T] = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ $\quad tr([T]) = 2 \neq 0$ thus T is diagonalizable

$[T]\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x - y \\ -x + y \end{bmatrix}$

3. Any polynomial of form c, where $c \in F$

If $f = c$, $T(f) = 0$

Thus $sp\{T(f)\} \subseteq sp\{f\}$ so any c are eigenvectors with eigenvalue 0