

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Solve the linear system

$$\begin{cases} (5+i)z_1 + (1-2i)z_2 = -4 \\ (2+i)z_1 + (3-i)z_2 = 1 \end{cases}$$

Answer: $(z_1, z_2) = \left(\frac{-13+6i}{12+i}, \frac{13+5i}{12+i} \right) = \left(\frac{-150+85i}{145}, \frac{161+47i}{145} \right)$

2. find $\langle [1-i, 1-3i, 2-i], [5-i, 1+i, i] \rangle$.

Answer: $\langle [1-i, 1-3i, 2-i], [5-i, 1+i, i] \rangle = \underline{3+10i}$

3. Prove that for $\vec{u}, \vec{v} \in \mathbb{C}^n$, we have $(\vec{u}^* \vec{v})^* = \overline{\vec{u}^* \vec{v}} = \vec{v}^* \vec{u} = \vec{u}^T \vec{v}$.

Solution :

Section 9-3, problem 40.