Define a bilinear map $E : \mathcal{V} \times \mathcal{V} \to \mathcal{V}$ with the following properties:

i. Bilinear property: $E(a\boldsymbol{x} + b\boldsymbol{y}, \boldsymbol{z}) = aE(\boldsymbol{x}, \boldsymbol{z}) + bE(\boldsymbol{y}, \boldsymbol{z})$, $E(\boldsymbol{x}, a\boldsymbol{y} + b\boldsymbol{z}) = aE(\boldsymbol{x}, \boldsymbol{y}) + bE(\boldsymbol{x}, \boldsymbol{z})$ where $\boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V}$ and $a, b \in \mathbb{F}$.

ii. Antisymmetric property: $E(\boldsymbol{x}, \boldsymbol{y}) = -E(\boldsymbol{y}, \boldsymbol{x})$.

iii. Orthogonal property: $g(E(\boldsymbol{x}, \boldsymbol{y}), \boldsymbol{x}) = g(E(\boldsymbol{x}, \boldsymbol{y}), \boldsymbol{y}) = 0$ where $g : \mathcal{V} \times \mathcal{V} \to \mathbb{F}$ is the non-degenerate, bilinear form that defines the inner product between two vectors.