1. True or False?

Suppose U is a finite dimensional subspace of an inner product space V. Then $E(1, P_U) = \operatorname{range} P_U$.

2. True or False?

Suppose U and W are subspaces of a finite dimensional inner product space such that $P_U P_W = 0$. Then $P_W P_U = 0$.

3. True or False?

Suppose V is an inner product space and define a map $\Gamma : V \to V'$ where for any $v \in V$, $\Gamma v \in V'$ is the functional defined by $(\Gamma v)(u) = \langle u, v \rangle$. Then Γ is a linear map.