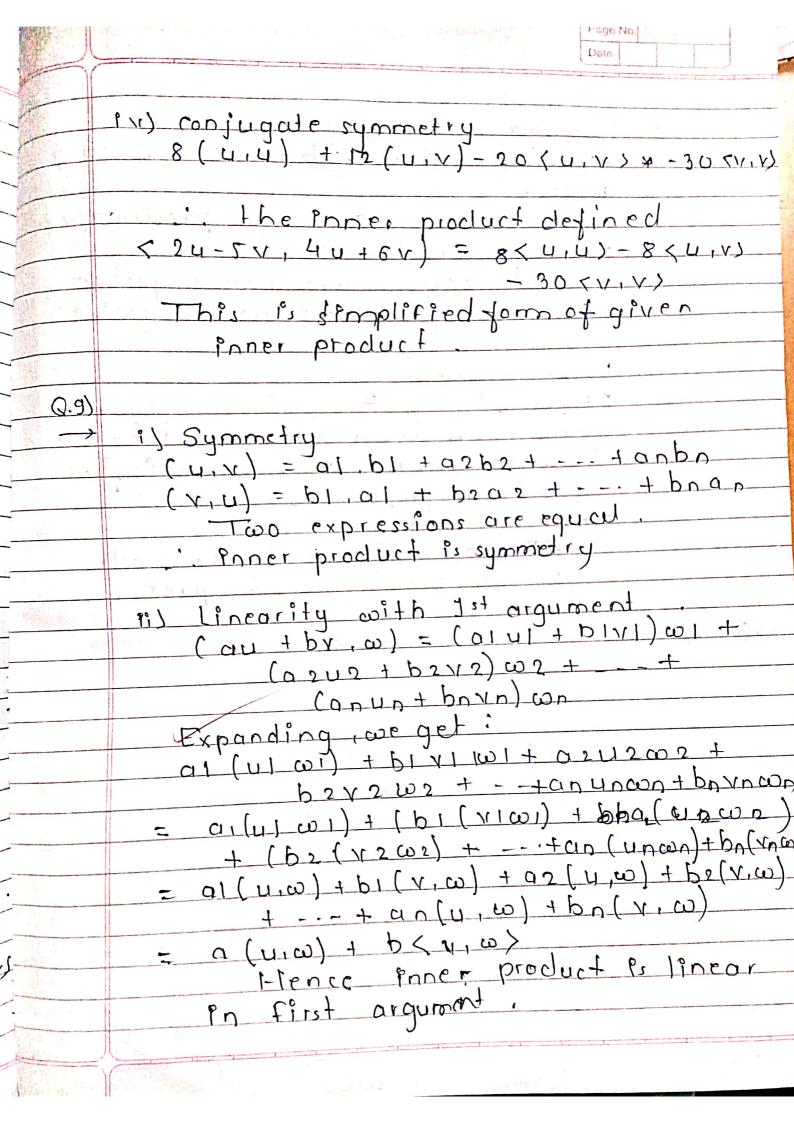


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3) Conjugate symmetry:

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i înner product li non-negative 4) Non-degeneracy Pf(u, y) = 012 + 022 + - - + an2=0 then each term sum must be zero : Since each term es satisfier all four properties of an enner prod . Rr with defined inner product is an inner product space

To find a vector $u \in \mathbb{R}^3$ such that $q(v) = \langle u, v \rangle$ belongs to V, we need to find a vector u that satisfies the conditions imposed by V.

Let's denote $v = (x, y, z) \in R^3$. Then, q(v) = x + 2y - 3z. We want to find u such that $q(v) = \langle u, v \rangle$.

Using the dot product formula, $\langle u, v \rangle = u_1x + u_2y + u_3z$.

By comparing the coefficients of x, y, and z on both sides of the equation, we can determine the values of u_1 , u_2 , and u_3 .

From q(v) = x + 2y - 3z, we have:

$$u_1 = 1$$

 $u_2 = 2$
 $u_3 = -3$

Thus, the vector u = (1, 2, -3) belongs to R^3 and satisfies $q(v) = \langle u, v \rangle$ for all $v \in R^3$.