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1.a. $\langle \bar{u}, \bar{v} \rangle = u_1^2 v_1 + u_2 v_2^2$ di R^2

o> $\langle \bar{v}, \bar{u} \rangle = v_1^2 u_1 + v_2 u_2^2$

$\langle \bar{u}, \bar{v} \rangle \neq \langle \bar{v}, \bar{u} \rangle$

$\therefore$ $\langle \bar{u}, \bar{v} \rangle = u_1^2 v_1 + u_2 v_2^2$ bukan merupakan RHD di R^2

b. $\langle \bar{u}, \bar{v} \rangle = u_1 v_1 + 2 u_2 v_2 - u_3 v_3$ di R^3

o> $\langle \bar{v}, \bar{u} \rangle = v_1 u_1 + 2 v_2 u_2 - v_3 u_3$

$\langle \bar{u}, \bar{v} \rangle = \langle \bar{v}, \bar{u} \rangle$

o> $\langle \bar{u}+\bar{v}, w \rangle = \langle (u_1+v_1, u_2+v_2, u_3+v_3), (w_1, w_2, w_3) \rangle$

$= (u_1+v_1) w_1 + 2(u_2+v_2) w_2 - (u_3+v_3).w_3$

$= u_1 w_1 + v_1 w_1 + 2u_2 w_2 + 2v_2 w_2 - u_3 w_3 - v_3 w_3$

$= (u_1 w_1 + 2u_2 w_2 - u_3 w_3) + (v_1 w_1 + 2 v_2 w_2 - v_3 w_3)$

$= \langle \bar{u}, \bar{w} \rangle + \langle \bar{v}, \bar{w} \rangle$

o> $\langle k\bar{u}, \bar{v} \rangle = \langle (ku_1, ku_2, ku_3), (v_1, v_2, v_3) \rangle$

$= ku_1 v_1 + 2 ku_1 v_1 - ku_3 v_3$

$= u_1 . kv_1 + 2u_1 . kv_1 - u_3 . kv_3$

$= k(u_1 v_1 + 2u_1 v_1 - u_3 v_3)$

$= k \langle \bar{u}, \bar{v} \rangle = \langle \bar{u}, k\bar{v} \rangle$

o> $\langle \bar{u}, \bar{u} \rangle = u_1^2 + 2u_2^2 - u_3^2$

Saat $u_3^2 > u_1^2 + 2u_2^2$ maka $\langle \bar{u}, \bar{u} \rangle < 0$

Tidak memenuhi positivitas

$\therefore$ $\langle \bar{u}, \bar{v} \rangle = u_1 v_1 + 2 u_1 v_1 - u_3 v_3$ bukan RHD di R^3

c. $\langle \bar{u}, \bar{v} \rangle = u_1 v_3 + u_2 v_2 + u_3 v_1$ di R^3

o> $\langle \bar{v}, \bar{u} \rangle = v_1 u_3 + v_2 u_2 + v_3 u_1$

$= u_1 v_3 + u_2 v_2 + u_3 v_1$

$= \langle \bar{u}, \bar{v} \rangle$

o> $\langle \bar{u}+\bar{v}, \bar{w} \rangle = (u_1+v_1)w_3 + (u_2+v_2)w_2 + (u_3+v_3)w_1$

$= u_1w_3 + v_1w_3 + u_2w_2 + v_2w_2 + u_3w_1 + v_3w_1$

$= (u_1w_3 + u_2w_2 + u_3w_1) + (v_1w_3 + v_2w_2 + v_3w_1)$

$= \langle \bar{u}, \bar{w} \rangle + \langle \bar{v}, \bar{w} \rangle$

o> $\langle k\bar{u}, \bar{v} \rangle = ku_1v_3 + ku_2v_2 + ku_3v_1$

$= u_1 \cdot kv_3 + u_2 \cdot kv_2 + u_3 \cdot kv_1$

$= k(u_1v_3 + u_2v_2 + u_3v_1)$

$= k\langle \bar{u}, \bar{v} \rangle = \langle \bar{u}, k\bar{v} \rangle$

o> $\langle \bar{u}, \bar{u} \rangle = u_1u_3 + u_2u_2 + u_3u_1$

$= 2u_1u_3 + u_2^2$

Saat $-2u_1u_3 > u_2^2$ maka $\langle \bar{u}, \bar{u} \rangle \leq 0$

Tidak memenuhi positivitas

$\therefore$ $\langle \bar{u}, \bar{v} \rangle = u_1v_3 + u_2u_2 + u_3u_1$ bukan RHD di R^3

2. $\bar{u} = (k, k, 1)$

$\bar{v} = (k, 5, 6)$

$\langle \bar{u}, \bar{v} \rangle = 0$

$k.k + k.5 + 1.6 = 0$

$k^2 + 5k + 6 = 0$

$(k+1)(k+5) = 0$

$k = -1 \vee k = -5$

$\therefore$ Nilai k yang memenuhi adalah $k = -1$ atau $k = -5$