Soal

Misalkan $S = \{ v_1, v_2, v_3 \}$ dengan

$v_1 = (2, -1, 3), \quad v_2 = (4, 1, 2), \quad v_3 = (8, -1, 8)$

Periksa apakah himpunan S merentang R^3.

$a_1(2, -1, 3) + a_2(4, 1, 2) + a_3(8, -1, 8)$

$= (x, y, z)$

$$\begin{bmatrix} 2 & 4 & 8 \\ -1 & 1 & -1 \\ 3 & 2 & 8 \end{bmatrix} \begin{bmatrix} a_1 \\ a_2 \\ a_3 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$\begin{array}{cc|cc} 2 & 4 & 8 & 2 & 4 \\ -1 & 1 & -1 & -1 & 1 \\ 3 & 2 & 8 & 3 & 2 \end{array}$$

$\det(A) = 2 \cdot 1 \cdot 8 + 4 \cdot -1 \cdot 3 + 8 \cdot -1 \cdot 2 - 8 \cdot 1 \cdot 3 - 2 \cdot -1 \cdot 2 - 4 \cdot -1 \cdot 8$

$= 16 + (-12) + (-16) - 24 + 4 + 32$

$= 0 ,,$

karena hasilnya $= 0$, maka himpunan S tidak merentang R^3.