

1. Show that the vectors  $u = (1, 0, -5)$ ,  $v = (2, 3, 0)$ ,  $w = (5, 6, -5)$  of  $\mathbb{R}^3$  are linearly dependent.

2. Find the dimension of the solution space of the system 
$$\begin{cases} x + 2y - 3z = 0 \\ 4y + z = 0 \\ 2x - 8y - 9z = 0 \end{cases}$$