

Q2.

① zero vector $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$ is in V because $b=0$.

② ~~For~~ Take $u = \begin{bmatrix} a_1 \\ b_1 \end{bmatrix}$ and $v = \begin{bmatrix} a_2 \\ b_2 \end{bmatrix}$ in V .

Being in V means that $b_1 \geq 0$ and $b_2 \geq 0$.

So, $u + v = \begin{bmatrix} a_1 + a_2 \\ b_1 + b_2 \end{bmatrix}$ - $b_1 + b_2 \geq 0$

\therefore The sum of two elements of V is again in V .

③ If t is any scalar, the $t u = \begin{bmatrix} t a_1 \\ t b_1 \end{bmatrix}$ $b_1 \geq 0$

however, when $t < 0$ and $b_1 > 0$ $t b_1 < 0$

which means that $t b_1 = b < 0$

At this time $t u$ does not in V

So According above, it is not true.

