

Determine the values of the parameter t for which the vectors

$$\mathbf{u}(t) = (t - 1, 3), \quad \mathbf{v}(t) = (1, t + 1)$$

are linearly independent.

1. SOLUTION

The vectors are linearly dependent if and only if

$$\det \begin{pmatrix} t - 1 & 3 \\ 1 & t + 1 \end{pmatrix} = 0,$$

which means $t^2 - 4 = 0$, or $t = \pm 2$.

Thus, the vectors are linearly independent if and only if $t \neq \pm 2$.