

Linear Algebra

1. If $A = \begin{pmatrix} 1 & 0 & 2 \\ 5 & 3 & 10 \\ 0 & 18 & 4 \end{pmatrix}$, find a lower-triangular matrix L and an upper-triangular matrix U such that $A = LU$.

2. Find the value of a for which $\det \begin{pmatrix} 1 & 2 & 3 & 4 \\ 0 & 1 & 5 & 6 \\ 0 & 0 & 1 & 7 \\ 1 & 0 & 0 & a \end{pmatrix} = 0$.