

**Linear Algebra**

1. Suppose

$$A = \begin{pmatrix} 3 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad \text{and} \quad A^{-1} = \begin{pmatrix} 1/3 & 0 & a \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}.$$

Determine the value of  $a$ .

2. Write the column vector  $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$  as a linear combination of the vectors  $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$  and  $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ .