

Name:

1. For each of the following statements, write the word “true” or “false.”

(a) The set of matrices of the form

$$\begin{pmatrix} a & a-b \\ a+b & b \end{pmatrix}$$

is a linear vector space.

(b) The set of matrices of the form

$$\begin{pmatrix} a & ab \\ ab & b \end{pmatrix}$$

is a linear vector space.

2. Let $\mathbf{v}_1 = (1, 2, 0)$ and $\mathbf{v}_2 = (-1, 3, 1)$. Find perpendicular vectors \mathbf{p}_1 and \mathbf{p}_2 such that $\text{Span}\{\mathbf{p}_1, \mathbf{p}_2\} = \text{Span}\{\mathbf{v}_1, \mathbf{v}_2\}$.