

**Linear Algebra**

1. Find values of  $a$  and  $b$  for which the vector  $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$  is an eigenvector of the matrix  $\begin{pmatrix} 1 & a \\ 2 & b \end{pmatrix}$  with eigenvalue 5.

2. In the space  $C[0, 1]$  with inner product  $\langle f, g \rangle = \int_0^1 f(x)g(x) dx$ , use the Gram-Schmidt procedure to find an orthonormal basis for the subspace spanned by the functions 1 and  $x$ .