

# Linear Algebra Final Exam Review

## Number of questions—5

1. Determine whether all vectors of the form  $(a, a^2, a^3, a^4)$  constitute a subspace of  $R^4$ .
2. Find the coordinate vector of  $\mathbf{w} = (1, 1)$  relative to basis  $S = \{(2, -4), (3, 8)\}$ .
3. Find bases for the null space and row space of

$$A = \begin{bmatrix} 0 & -1 & -4 \\ -1 & 0 & -4 \\ -2 & 3 & 4 \end{bmatrix}.$$

4. Find a matrix  $P$  that diagonalizes

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}.$$

5. Use the Gram-Schmidt process to transform the basis  $\{(1, 0), (3, -5)\}$  into an orthonormal basis.