Homework 9 **:** This homework is due on **November** 8.

1. Find the dimension of the subspace of R_5 consisting of all vectors $\begin{bmatrix} a & b & c & d & e \end{bmatrix}$ of the form $c = b + 2d$ and $e = a - b + 4d$.

2. Find the dimension of the subspace of R^4 spanned by the vectors $\begin{bmatrix} 1 & 0 & 0 & 1 \end{bmatrix}$, $\begin{bmatrix} 0 & 1 & 0 & 0 \end{bmatrix}$, $\begin{bmatrix} 1 & 1 & 1 & 1 \end{bmatrix}$ and $\begin{bmatrix} 0 & 1 & 1 & 1 \end{bmatrix}$.

3. Give an example of a $3-$dimensional subspace of P_3.

4. Find the dimension of the subspace of M_{44} consisting of diagonal matrices.

5. Find the dimension of the subspace of M_{33} consisting of symmetric matrices.

6. Find the dimension of the subspace of P_2 consisting of all vectors of the form $at^2 + bt + c$, where $b = 2c - 3a$.

7. Find the dimension of the subspace of the space of all continuous real-valued functions spanned by $\{\cos^2(t), \sin^2(t), \cos(2t)\}$.