

Name: _____

Section: _____

1. Find a basis for the column space of A , where A is the matrix given below. What is the rank of the linear transformation $\mathbf{x} \mapsto A\mathbf{x}$? (The rank of a linear transformation T is the dimension of the range of T).

$$A = \begin{bmatrix} 2 & -1 & 11 \\ 0 & -2 & 2 \\ 1 & -1 & 6 \end{bmatrix}$$

2. Consider the basis $\mathcal{B} = \{1, 1 + x, 1 + x + x^2\}$ for \mathbb{P}_2 . Suppose $\mathbf{v} \in \mathbb{P}_2$ is such that $[\mathbf{v}]_{\mathcal{B}} = (1, -1, 0)^T$. What is \mathbf{v} ?

3. Find the coordinates of the vector $(0, 1)^T$ with respect to the basis $\{(2, 1)^T, (1, 2)^T\}$ for \mathbb{R}^2 .