

Name: _____

1. (10 pts.) Find bases for the kernel and the image of $A = \begin{bmatrix} 1 & 3 & 1 & 2 \\ 1 & 3 & 1 & 4 \end{bmatrix}$
2. (10 pts.) Let $v = (1, 2, 3)$ and define $T: \mathbf{R}^3 \rightarrow \mathbf{R}^3$ by $T(x) = v \times x$. Find bases for the kernel and the image of T .
3. (10 pts.) Find two subspaces of \mathbf{R}^2 whose union is not a subspace of \mathbf{R}^2 .
4. (10 pts.) Suppose v and w are linearly independent vectors in \mathbf{R}^3 . Define $T: \mathbf{R}^3 \rightarrow \mathbf{R}$ by letting $T(x) = \det \begin{bmatrix} x & v & w \end{bmatrix}$. Describe the kernel of T . What is its dimension?
5. (20 pts.) Let $A = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$.
 - (a) Find all eigenvalues of A and the corresponding eigenvectors.
 - (b) Find a formula for A^n .

1	2	3	4	5	total (60)	%