

Name:

1. (a) Calculate the determinant of $\begin{bmatrix} 2 & 3 & -4 \\ 2 & 4 & -4 \\ 0 & 4 & 1 \end{bmatrix}$.

- (b) For which value(s) of a is the matrix $\begin{bmatrix} a-1 & 0 & 1 \\ 2 & -1 & 1 \\ -4 & 2 & a \end{bmatrix}$ singular (i.e. not invertible)?

2. Find the eigenvalues of the matrix $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 0 \\ 6 & 0 & 0 \end{bmatrix}$, and for each eigenvalue, find a basis for the corresponding eigenspace.