

Problem 1. Find a basis for the column space of the following matrix:

$$\begin{pmatrix} 1 & 2 & 1 & 0 \\ 0 & 0 & 6 & 2 \\ 4 & 8 & 4 & 0 \\ 2 & 4 & 5 & 1 \\ 0 & 0 & 3 & 1 \end{pmatrix}$$