1. Find a basis for the kernel and range of the linear transformation $L: \mathbb{R}^3 \to \mathbb{R}^2$ given by

$$L(v) = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \end{bmatrix} v.$$ 

2. Use Gram-Schmidt to turn $\{(1, 1, 3), (0, 3, 1), (1, 1, 0)\}$ into an orthogonal basis (it doesn’t have to be orthonormal).