

1. Perform Gram-Schmidt on $\begin{bmatrix} 2 \\ 2 \\ 1 \end{bmatrix}; \begin{bmatrix} 3 \\ 3 \\ 6 \end{bmatrix}$

2. Perform Gram-schmidt on $\begin{bmatrix} 4 \\ 4 \\ 2 \end{bmatrix}; \begin{bmatrix} -4 \\ 2 \\ 4 \end{bmatrix}; \begin{bmatrix} 36 \\ 0 \\ 0 \end{bmatrix}$

3. Find the QR factorisation of $\begin{bmatrix} 4 & 5 & 0 \\ 0 & 0 & -3 \\ 3 & -5 & 0 \end{bmatrix}$

4. Find an orthogonal basis for both the kernel and the image of $A = \begin{bmatrix} 2 & 3 & 0 \\ 1 & 7 & 6 \\ -2 & 8 & 10 \end{bmatrix}$

5. Find the QR factorisation of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & -1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 0 & -4 & 5 \\ 0 & 0 & 6 \end{bmatrix}$ Hint: look at definition of QR factorisation, and think of a row operation as a matrix.