1. Suppose $A = \begin{bmatrix} -17 & 50 \\ -10 & 28 \end{bmatrix}$

1A: Is $\mathbf{c} = \begin{bmatrix} 5 \\ 4 \end{bmatrix}$ an eigenvector of A? If so, what's the eigenvalue? If not, why not?

1B: Is $\mathbf{c} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$ an eigenvector of A? If so, what's the eigenvalue? If not, why not?

2. Let $M = \begin{bmatrix} 1 & 3 & 7 \\ 3 & 1 & 5 \\ 2 & 1 & 4 \end{bmatrix}$; then the first two column vectors $\mathbf{m}_1$ and $\mathbf{m}_2$ of M are a basis $\mathcal{B}$ of $\mathrm{Col}(M)$.

Another basis for M (you don't have to check this) is $\mathcal{C} = \{\mathbf{c}_1, \mathbf{c}_2\}$, where $\mathbf{c}_1 = \begin{bmatrix} 9 \\ 11 \\ 8 \end{bmatrix}$ and $\mathbf{c}_2 = \begin{bmatrix} 6 \\ 10 \\ 7 \end{bmatrix}$.

2A: Let $\mathbf{k} = M \begin{bmatrix} 3 \\ 4 \\ 2 \end{bmatrix}$ (this is a LC of the columns of M). What is $\mathbf{k}$ explicitly?

2B: Find each of the following: $[\mathbf{k}]_{\mathcal{B}}$ $[\mathbf{k}]_{\mathcal{C}}$

2C: Find each of these: $[\mathbf{m}_1]_{\mathcal{B}}$ $[\mathbf{m}_2]_{\mathcal{B}}$

2D: Find the change of basis matrix P from $\mathcal{B}$ to $\mathcal{C}$.

2E: Show that your matrix P "changes" $[\mathbf{k}]_{\mathcal{B}}$ into $[\mathbf{k}]_{\mathcal{C}}$ appropriately.