

## Practice problems.

- (1) Write the vector  $\mathbf{v} \in \mathbb{R}^2$  in the ordered basis  $\mathcal{B}$ , where

$$\mathbf{v} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \quad \mathcal{B} = \left( \begin{bmatrix} 1 \\ 3 \end{bmatrix}, \begin{bmatrix} 2 \\ 4 \end{bmatrix} \right).$$

- (2) Now, using the same procedure, write the vector  $\mathbf{v} \in \mathbb{R}^2$  in the ordered basis  $\mathcal{C}$ , where

$$\mathbf{v} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \quad \mathcal{C} = \left( \begin{bmatrix} 1 \\ 3 \end{bmatrix}, \begin{bmatrix} 4 \\ 2 \end{bmatrix} \right).$$

- (3) Find a change of basis matrix  ${}_C[I]_{\mathcal{B}}$ , and use it and the result of (a) to compute the answer to (b). (The book writes  $\mathcal{P}_{\mathcal{C} \leftarrow \mathcal{B}}$  instead of  ${}_C[I]_{\mathcal{B}}$ .)