

MATH 54 SUMMER 2017, QUIZ 14

Suppose  $\mathbf{v}$  is a vector in  $\mathbb{R}^2$  such that  $[\mathbf{v}]_{\mathcal{B}} = \begin{bmatrix} -3 \\ 2 \end{bmatrix}$ , where  $\mathcal{B}$  and  $\mathcal{C}$  are the bases for  $\mathbb{R}^2$  shown below (you do not need to check that they are bases for  $\mathbb{R}^2$ ).

$$\mathcal{B} = \left\{ \begin{bmatrix} 2 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ -1 \end{bmatrix} \right\} \quad \mathcal{C} = \left\{ \begin{bmatrix} 2 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 2 \end{bmatrix} \right\}$$

(a) What is  $\mathbf{v}$ ?

(b) What is  $[\mathbf{v}]_{\mathcal{C}}$ ?