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

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

(a) What is $v$?

(b) What is $[v]_C$?

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