Linear Algebra

Instructions   Please write your name in the upper right-hand corner of the page. Use complete sentences, along with any necessary supporting calculations, to answer the following questions.

1. Find a 2×2 matrix A that has the vectors $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ as eigenvectors with corresponding eigenvalues 3 and 4.

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2. If a 2×2 matrix A has the numbers 1 and 3 as eigenvalues, and a 2×2 matrix B has the numbers 1 and 4 as eigenvalues, must the product matrix AB have the numbers 1 and 12 as eigenvalues? Explain why or why not.