Consultation is fine, but no electronics, please.

Matrix $A = \begin{bmatrix} 5 & 0 & 0 \\ 1 & 5 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 2 & 0 \\ 3 & 0 & 3 \end{bmatrix}$.

(1) Find the eigenvalues (with multiplicities) and corresponding eigenvectors of A.

(2) Find a basis for $\mathbb{R}^3$ that consists of eigenvectors of A. How do you know it's a basis?

TURN OVER FOR MORE! MORE!

(3) Prove that B is invertible. (Hint: Determinant!)

(4) Are A and $B^{-1}AB$ similar? Circle one: Yes No

(5) Find the eigenvalues (with multiplicities) and corresponding eigenvectors of $B^{-1}AB$.