MATH 3D Prep: Eigenvalue and Eigenvectors

Facts to Know:

A is an $n \times n$ matrix:

- λ is an *eigenvalue* of A if there is a ________________ vector $\vec{v}$ such that ______________.
- Such $\vec{v}$ is called an ____________________ of A corresponding to eigenvalue λ.
- λ is an eigenvalue if and only if ____________________.
- The set of all solutions to ____________________ is called the *eigenspace* of A corresponding to λ.

Examples:

1. Let $A = \begin{bmatrix} 5 & 2 \\ 1 & 4 \end{bmatrix}$, find all eigenvalues, and for each eigenvalue, find a basis for the corresponding eigenspace.