

## Reading Questions 19

### Example 7.3.2

1. The distinct nonzero vectors  $\vec{v}_1$  and  $\vec{v}_2$  both can be eigenvectors of the eigenvalues  $\lambda$ .
2. If  $\lambda$  is an eigenvalue of  $A$  then  $\ker A - \lambda I$  can be used to find an eigenvector of  $A$ .
3. What is the eigenspace of matrix?

## Section 7.3 Finding the eigenvectors of a matrix (Part 1)

### Eigenspaces

**P 1.** Find the eigenvectors for the matrix  $A = \begin{bmatrix} -3 & 0 & 4 \\ 0 & -1 & 0 \\ -2 & 7 & 3 \end{bmatrix}$ .

**P 2.** For each eigenvalue  $\lambda$  of  $A$  find the algebraic and geometric multiplicity of  $\lambda$ .

**P 3.** Are the matrices  $A = \begin{bmatrix} -3 & 0 & 4 \\ 0 & -1 & 0 \\ -2 & 7 & 3 \end{bmatrix}$  and  $B = \begin{bmatrix} 3 & 0 & 0 \\ 2 & 1 & 0 \\ 2 & 7 & 3 \end{bmatrix}$  similar?

**P 4.** Is the matrix  $B$  diagonalizable?

**P 5.** Suppose the matrices  $C$  and  $D$  are similar.

1. Show that the matrices  $C - \lambda I$  and  $D - \lambda I$  are similar.

2. What can you conclude about the kernels of the matrices  $C$  and  $D$ ?

3. Show that the geometric multiplicity of  $C$  and  $D$  are the same.