

Homework Section 10.5

I. Consider the matrix $A = \begin{bmatrix} 5 & 0 \\ 2 & 1 \end{bmatrix}$ and the vector $v = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$.

A. The vector v given above is an eigenvector for the matrix A .

1. Find λ such that $Av = \lambda v$ (using the matrix A and vector v given above).
2. What is $A^{10}v$? (Do not calculate A^5 , instead, use the properties of eigenvectors and eigenvalues to make the calculation.)

B. The number $\lambda=1$ is another eigenvalue for A . This means that the equation

$$Av = v$$

has nonzero solutions. Find a vector v that is not changed by A , i.e. such that the equation above holds.

II. Do problems 14 and 20 page 594. Express your final answers in sentences.