

Problem Set 6.1, page 293

- 2 A has $\lambda_1 = -1$ and $\lambda_2 = 5$ with eigenvectors $x_1 = (-2, 1)$ and $x_2 = (1, 1)$. The matrix $A + I$ has the same eigenvectors, with eigenvalues increased by 1 to 0 and 6 . That zero eigenvalue correctly indicates that $A + I$ is singular.
- 5 A and B have eigenvalues 1 and 3. $A + B$ has $\lambda_1 = 3$, $\lambda_2 = 5$. Eigenvalues of $A + B$ *are not equal* to eigenvalues of A plus eigenvalues of B .
- 6 A and B have $\lambda_1 = 1$ and $\lambda_2 = 1$. AB and BA have $\lambda = 2 \pm \sqrt{5}$. Eigenvalues of AB *are not equal* to eigenvalues of A times eigenvalues of B . Eigenvalues of AB and BA *are equal* (this is proved in section 6.6, Problems 18-19).
- 7 The eigenvalues of U (on its diagonal) are the *pivots* of A . The eigenvalues of L (on its diagonal) are all 1's. The eigenvalues of A *are not* the same as the pivots.