Problem 1 Wednesday 4/18
Do problem 5 of section 6.3 in your book.

Problem 2 Wednesday 4/18
Do problem 11 of section 6.3 in your book.

Problem 3 Wednesday 4/18
Let 
\[ A = \begin{bmatrix} 0 & 1 & 2 & 3 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} . \]
(a) What are the eigenvalues of \( A \)?
(b) How many linearly independent eigenvectors does \( A \) have? Find them.
(c) Find \( e^{At} \).
(d) Find the solution to the differential equation \( \frac{du}{dt} = Au \) when \( u(0) = [1 \quad 1 \quad 1 \quad 1]^T \).

Problem 4 Friday 4/20
Do problem 9 of section 6.4 in your book.

Problem 5 Friday 4/20
Do problem 16 of section 6.4 in your book.

Problem 6 Friday 4/20
Do problem 18 of section 6.4 in your book.

Problem 7 Friday 4/20
Do problem 27 of section 6.4 in your book.

Problem 8 Monday 4/23
Do problem 4 of section 6.5 in your book.

Problem 9 Monday 4/23
Do problem 19 of section 6.5 in your book.

Problem 10 Monday 4/23
Let \( A \) be any \( 3 \times 3 \) symmetric matrix. Is it true that for large enough \( t \), \( A + tI \) is positive definite?