

**Part I: Chapter 5, no Calculations. 40 %**

- Eigenvalues and eigenvectors.
- Diagonalization.
- Eigenspaces.

**Part II: Theory, no calculators. 20 %**

- Derive the quadratic formula.
- A surprise.

**Part III: Differential equations, calculators allowed. 40%**

You will be given 4  $2 \times 2$  systems of linear differential equations. The eigenvalues and associated eigenvectors will be provided in Maple's output format. You will be asked to find general solution, draw phaseplots and solve initial value problems.