Guide for Final Exam

- The final exam is on Tuesday 7 June from 12:20–2:20pm, in our classroom.

- Bring a calculator (for arithmetic).

- The exam is cumulative, so any question that would be fair for the first two tests is possible. About half the questions are on old material, and half from the material since the second test (Sections 9.3,9.4, and 10.1–10.5).

- Guaranteed question:
  Let
  $$A = [* * *given * **]$$

  1. Use Householder's method to bring this matrix to tridiagonal form.
  2. Do one step of the (unshifted) QR iteration for finding eigenvalues to the result.
  3. Describe how the QR iteration would continue.
  4. Describe how and why shifting is used within this algorithm.

- Likely question:
  Consider the nonlinear system of equations *****

  1. Apply one step of Newton's method starting at ****.
  2. Describe how Broyden's method would be applied to this system.
  3. Apply one step of the steepest descent technique starting at ****.
  4. Describe the relative advantages and disadvantages of these methods.
  5. Show that [more abstract proof]