MAU11S02 sixth Monday quiz, week 8
Monday 22/3/21 due 4pm Monday 29/3/21

Rules and procedures.
1. Attempt 3 questions. Only *your first three answers* will be marked. **2.** Each question carries 20 marks, so the maximum quiz mark is 60. **3.** If a particular method of solution is stipulated, you get no marks if you don't use it. **4.** ***Show all work.*** No marks will be given for answers which do not show the calculations. **5.** Your answers should be scanned and submitted to Blackboard as a 'Monday assignment.'

Question 1. Calculate the least-squares linear estimate $y = mx + c$ for the data

$$(-3, 2),\ (-2, 1),\ (-1, 1),\ (1, 1)$$

Question 2. Calculate the least-squares quadratic estimate $y = ax^2 + bx + c$ for the data in Question 1.

Question 3. Let

$$A = \begin{bmatrix} -5 & 2 \\ -28 & 10 \end{bmatrix}$$

Calculate eigenvalues and eigenvectors for A.

Question 4. Hence express A in the form $SA'S^{-1}$ where A' is a diagonal matrix, and evaluate e^A.

Question 5. With S, A, A' as above, evaluate $\cos(A\pi/6)$. (Recall $\cos x = 1 - x^2/2! + x^4/4! \ldots$ and refer to the connection between e^A and $e^{A'}$ in the notes.)