MAU11S02 Group A2 Quiz 04 3pm 19/2/20

Rules and procedures.
1. Answers must be handed up at the end of the tutorial, no other time. **2.** Attempt 3 questions. Only *your first three answers* will be marked. **3.** Each question carries 20 marks, so the maximum quiz mark is 60. **4.** Marked quizzes will be returned, and answers published, the following week. **5.** If a particular method of solution is stipulated, you get no marks if you don't use it. **6.** The (9) quizzes will contribute 20% to your overall mark. **7.** You are allowed to collaborate and compare answers during the tutorial. **8.** ***Show all work.*** No marks will be given for answers which do not show the calculations.

Question 1.
Calculate bases for the row space, column space, and nullspace of the following matrix

$$\begin{bmatrix} 1 & 0 & 6 \\ 3 & -1 & 17 \\ 1 & 1 & 7 \end{bmatrix}$$

Question 2. Calculate a basis for the space of all linear combinations

$$\{\alpha_1(1,1,7) + \alpha_2(1,0,6) + \alpha_3(3,-1,17) : \alpha_1, \alpha_2, \alpha_3 \in \mathbb{R}\}$$

Question 3. Calculate bases for the row and column spaces of the following matrix

$$\begin{bmatrix} 2 & 4 & 0 & 0 & 8 \\ 3 & 6 & 0 & 1 & 13 \\ 0 & 0 & 1 & -1 & 3 \\ 3 & 6 & 0 & 3 & 15 \end{bmatrix}$$

Question 4. Calculate a basis for the nullspace of the matrix in Question 3.

Question 5. Do the three polynomials

$$(x-1)^2, x^2, (x-1)(x+1)$$

form a basis for the space of all polynomials of degree ≤ 2? Explain your answer, with calculations.