

Books, watches, notes or cell phones are **not** allowed. The **only** calculators allowed are the Sharp EL-531\*\*\*. You **must** show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

**Question 1.** (5 marks) Find the value(s) of  $a$ , if any, for which the following system

$$\begin{cases} x + y + 3z = 2 \\ -3x + (a-1)y - 10z = -7 \\ 4x + (2-a)y + (a^2-8)z = a-2 \end{cases}$$

has

- exactly one solutions,
- infinitely many solutions,
- no solutions.

**Question 2.** (5 marks) Prove that if  $ad - bc \neq 0$ , then the reduced row echelon form of  $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$  is  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ .