Linear Algebra

1. Use Gauss-Jordan reduction to bring the matrix

$$\begin{pmatrix} 1 & 1 & -1 & -1 \\ 6 & 7 & -2 & 10 \\ 7 & 8 & -4 & 5 \end{pmatrix}$$

   to *reduced* echelon form.

2. For which value(s) of the parameter a does the linear system

$$\begin{aligned} 2x_2 - 2x_3 &= 3 \\ -6x_1 + 8x_2 + x_3 &= 0 \\ 2x_1 \qquad - ax_3 &= 4 \end{aligned}$$

   have infinitely many solutions for (x_1, x_2, x_3)?