1)

$$\begin{matrix} F1 \\ F2 \\ F3 \\ F4 \end{matrix}\begin{bmatrix} 1 & 1 & 1 & C \\ 2 & 2 & 2 & 2 \\ 0 & C & 2 & 3 \\ 7 & 1 & 2 & 3 \end{bmatrix} \xrightarrow{\substack{F4 = 7F1 - F4 \\ F2 \leftrightarrow F3}} \begin{bmatrix} 1 & 1 & 1 & C \\ 0 & C & 2 & 3 \\ 2 & 2 & 2 & 2 \\ 7 & 1 & 2 & 3 \end{bmatrix} \xrightarrow{\substack{F3 = 2F1 - F2 \\ F4 \leftrightarrow F3}} \begin{bmatrix} 1 & 1 & 1 & C \\ 0 & C & 2 & 3 \\ 0 & 6 & 5 & (7C+3) \\ 0 & 0 & 0 & (2C-2) \end{bmatrix} \xrightarrow{\substack{F2 = \frac{F2}{C} \\ F3 = 6F2 - F3}}$$

$$\begin{bmatrix} 1 & 1 & 1 & C \\ 0 & 1 & 2/C & 3/C \\ 0 & 0 & 12/C - 5 & 18/C(7C-3) \\ 0 & 0 & 0 & (2C-2) \end{bmatrix} = A$$

$$\text{Det}(A) = 1 \cdot 1 \cdot (12/C - 5) \cdot (2C-2) = 24 - \frac{24}{C} - 10C + 10$$

$$= 34 - \frac{24}{C} - 10C$$