(1) [5] Compute $\det(\mathbf{A})$ where

$$\mathbf{A} = \begin{bmatrix} 3 & 3 & 0 & 5 \\ 2 & 2 & 0 & -2 \\ 4 & 1 & -3 & 0 \\ 2 & 10 & 3 & 2 \end{bmatrix}$$

(2) [3] Suppose $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = -4$. Determine $\begin{vmatrix} -2a & -2b & -2c \\ d & e & f \\ g+3d & h+3e & i+3f \end{vmatrix}$.

(3) [5] Use Cramer's rule to solve for z:

$$\begin{aligned} 4x + 5y &= 2 \\ 11x + y + 2z &= 3 \\ x + 5y + 2z &= 1 \end{aligned}$$

(4) [2] If $\mathbf{A}$ is an $n \times n$ matrix with $\det(\mathbf{A}) = 7$ what is $\det\left((2\mathbf{A})^{-1}\right)$?