Assignment for Section 3.3: Cramer's Rule, inverses and volumes

(1) Solve the linear equations

$$\begin{aligned} 2x &+ y &&= 1 \\ x &+ 2y + z &= 0 \\ &\quad y + 2z &= 0 \end{aligned}$$

by Cramer's Rule.

(2) Let

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & 0 \\ 0 & 7 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}.$$

Find A^{-1} and B^{-1} from the cofactor formula.

(3) (a) Find the area of the triangle with corners $(2,1)$, $(3,4)$ and $(0,5)$.

(b) Find the area of the parallelogram with edges $\boldsymbol{v} = (3,2)$ and $\boldsymbol{w} = (1,4)$.

(c) Find the volume of the box with edges from $(0,0,0)$ to $(3,1,1)$, $(1,3,1)$ and $(1,1,3)$.