

## Homework 5

1. Find  $A^{-1}$  and  $B^{-1}$  (if they exist), where  $A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 1 & 1 & 2 \end{bmatrix}$ , and  $B = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 2 \\ 1 & 2 & 3 \end{bmatrix}$ .

2. Determine which of the following are linear transformations;

(a)  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $T(x, y, z) = (x + y, y + z)$ .

(b)  $T : \mathbb{R}^2 \rightarrow \mathbb{R}^3$  defined by  $T(x, y) = (2x, 2x + y, 3y)$ .

(c)  $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  defined by  $T(x, y) = (x^2, y^2)$ .