Supplementary homework problems for week 2.

1. Let $T = \begin{bmatrix} 1 & 0 & -1 & 2 & 1 \\ 2 & 0 & -2 & 4 & 2 \\ 0 & 1 & 1 & 1 & 1 \end{bmatrix}$

   Suppose that T is used to define a function in the usual way.

   (a) Compute the rank of T.

   (b) What is the domain of T?

   (c) What is the codomain of T?

   (d) Is T onto? Why or why not?

   (e) Is T one-to-one? Why or why not?

   (f) Is T a one-to-one correspondence? Why or why not?

2. Find the *rank* of each matrix from question (5)1 on page 18 of the book. You need to show work at least for those matrices where you cannot tell me the answer immediately.