1. From the textbook: 11.4, 11.12, 11.13, 12.13, 13.3, 13.20, 14.10, 14.12, 14.13(a)

2. Is there a 3×4 matrix with nullity 2 and rank 3? Give an example or show that no example exists.

   Hint: There's a theorem that relates the rank and the nullity of a matrix.

3. Example 14.5 in the book constructs the matrix that corresponds to the linear transformation from $\mathbb{R}^3$ to $\mathbb{R}^3$ given by counter-clockwise rotation around the x-axis by the angle θ. Find the matrix for the linear transformation from $\mathbb{R}^3$ to $\mathbb{R}^3$ given by counter-clockwise rotation around the y-axis by the angle θ.

   Hint: You should be able to construct the matrix using the following two observations:

   1. $T(e_2) = e_2$ since the y-axis is fixed.
   2. The effect on the xz-plane is that of an ordinary rotation in $\mathbb{R}^2$.