

Homework 3

Remarks: Do not turn in this homework. These problems are for practice. We may go over some of them in class, but we will do that only after you try them at home. You have to show your work and explain every step. For elementary row operations, you must write down each operation you do.

- (1) Solve the following system by Gaussian elimination and by Gauss-Jordan elimination.

$$2x_1 + 3x_2 + 4x_3 = 5.$$

$$3x_1 + 2x_2 + 2x_3 = 6.$$

$$x_1 + 2x_2 + 4x_3 = 7.$$

- (2) Let

$$A = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 2 & 2 \\ 1 & 2 & 4 \end{bmatrix}$$

- (a) Find $\det(A)$ by using Gaussian elimination. **Note:** *there is no need to perform Gaussian elimination again. Instead, take advantage of Gaussian elimination you performed in (1) above.*
- (b) Find A^{-1} by using Gauss-Jordan elimination. **Note:** *there is no need to perform Gauss-Jordan elimination again. Instead, take advantage of Gauss-Jordan elimination you performed in (1) above.*
- (3) Solve the following system by Gaussian elimination.

$$2x_1 + 3x_2 + 4x_3 = 5.$$

$$3x_1 + 2x_2 + 2x_3 = 6.$$

$$x_1 + 4x_2 + 6x_3 = 4.$$