Directions. Please work on the problems below. Your solutions must begin with a clear statement of the problem, followed by a clear, legible solution (or partial progress towards a solution). Please refer to the syllabus for the policy on grading and late homework.

Collaboration. I encourage you to discuss the homework problems with your classmates. However, each student must submit his or her own homework solutions.

1. Please solve exercises # 12, 18, 32, and 34 in section 12.7.

2. Please solve exercises # 2, 4, and 17 in section 12.8

3. (Bonus) Compute the determinant of the following square tri-diagonal matrix assuming that the matrix has 2012 rows:

\[
\begin{pmatrix}
1 & 1 & 0 & 0 & 0 & \ldots \\
1 & 1 & 1 & 0 & 0 & \ldots \\
0 & 1 & 1 & 1 & 0 & \ldots \\
0 & 0 & 1 & 1 & 1 & \ldots \\
0 & 0 & 0 & 1 & 1 & \ldots \\
\vdots & \vdots & \vdots & \vdots & \ddots & \ddots \\
\end{pmatrix}
\]

Clarification: the matrix has 1’s along each of the middle three diagonals, and 0’s in all other entries.