Exercises from Strang P.66 30; P.92 10, 11; P. 118 8, 13, 22[1], 39; P. 132 9, 10, 12, 13, 16, 20, 22-24, 27, 28, 32;

Extra Problems

1. Consider the three points $(1, -7)$, $(2, -16)$, $(3, -33)$. Use $PA = LU$ decomposition to find the quadratic polynomial that passes through these three points.

2. Using maximal partial pivoting, find the $PA = LU$ decompostion of the matrix

$$A = \begin{pmatrix} 1 & 2 & -1 \\ -2 & -7 & 4 \\ 5 & 1 & -3 \end{pmatrix},$$

then use your answer to solve

$$A\vec{x} = \begin{pmatrix} 2 \\ -12 \\ -10 \end{pmatrix}.$$

Note: The annoying fractions in the second extra problem above are a reason why MPP is not often used when doing hand computations. By hand, a good aim is to avoid fractions when possible. When implementing computer algorithms, the considerations are quite different!

[1] Use Maximal Partial Pivoting please!