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!

\footnote{Use Maximal Partial Pivoting please!}