Name:_____

MATH 320: QUIZ 5

(1) (6 points) Define the matrix

$$A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 1 & 0 \\ -2 & 0 & 2 \end{bmatrix}.$$

(a) Compute an LU Decomposition using "Naive Gaussian elimination." What are L and U?

(b) Solve the equation $Ax = (1, 2, 1)^T$ for x by first solving $Ld = b$ and then solving $Ux = d$ (using L and U from the last step). What are d and x?

(c) Compute the LU Decomposition using "Gaussian elimination with partial pivoting." What are L, U, and P?

(2) (4 points) Write a MATLAB function that computes a Cholesky decomposition for a 3×3 matrix A (assuming the input is symmetric and positive semi-definite). Precise wording is not as important as conceptual accuracy. Don't use the `chol` function!