Name: _____

Quiz 4 for MTH 222D, Fall2022

Please print these pages and staple them to your (neat, well-written) work as a cover page. This assignment is due on Friday, October 14th. Show all of your work. You should feel free to check your work using an online app. However, **you should not simply copy your work from such an app!** Doing so will be considered cheating.

In (1)-(3), please recall that some row (and column) operations change the determinant. See Theorem 3 on page 171 of the book and the examples following.

1. Find the determinant of the given matrix. You should use row operations to simplify the determinant, before you attempt to use the method of cofactor expansion:

$$A = \begin{pmatrix} 3 & -1 & 1 & 2 \\ 2 & 3 & 2 & 0 \\ 0 & 4 & 4 & 1 \\ 1 & 5 & -1 & 1 \end{pmatrix}.$$

2. Find the determinant of the given matrix. You should use row operations to simplify the determinant, before you attempt to use the method of cofactor expansion:

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

3. Find the determinant of the given matrix. You should use row operations to simplify the determinant, before you attempt to use the method of cofactor expansion:

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

4. Solve the system using Cramer's rule. Please do not use the method we discussed during the first week of class (involving RREFs, etc.):

$$\begin{aligned} x + y + z &= 5 \\ 2x - y + z &= 7 \\ x + 3y - z &= 1 \end{aligned}$$

5. Solve the system using Cramer's rule. Please do not use the method we discussed during the first week of class (involving RREFs, etc.):

$$\begin{aligned} 2x - y + z &= 5 \\ -x + 2y + z &= 7 \\ x - y + 2z &= 11 \end{aligned}$$

6. Find the inverse of the following matrix:

$$\begin{pmatrix} 2 & 1 & -1 \\ 1 & -1 & 1 \\ -1 & 1 & 2 \end{pmatrix}.$$

7. Find the inverse of the following matrix:

$$\begin{pmatrix} 3 & 4 & 2 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}.$$

8. Find the inverse of the following matrix:

$$\begin{pmatrix} 2 & 8 & 7 \\ 1 & 6 & 5 \\ 1 & 1 & 1 \end{pmatrix}.$$