MAT 1332, Fall 2015, Assignment 3
Due Friday November 24 at 2:00 pm.
Late assignments will not be accepted.

Instructor: Aziz Khanchi

Drop it in the box of 1332, found in Math dept (585 King Edward ave, Ottawa, ON): first floor, on the left wall.

Student Name _____ Student Number _____

QUESTION 1. Consider the complex number $z = 1 + i$. Use the polar form of z to find z^{20}. Finally, write z^{20} in the $a + bi$.

QUESTION 2. Let

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

Find the determinant of $AB + C^T$.

QUESTION 3. Let $A = \begin{bmatrix} 1 & 2 & 2 & 2 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix}$. Find A^{-1} and use it to solve

$$AX = \begin{bmatrix} 1 \\ 2 \\ 1 \\ 2 \end{bmatrix}.$$

QUESTION 4. Find the eigenvalues of $A = \begin{bmatrix} 2 & 3 \\ 3 & -6 \end{bmatrix}$ and the eigenspaces associated with each eigenvalue.

QUESTION 5. Find the general solution of the linear system

$$x_1 + 3x_2 + 4x_3 + 7x_4 = 0$$
$$3x_1 + 9x_2 + 7x_3 + 6x_4 = 0$$