

Class Assignments – 4

1. (from Moshe Brand> HW)

- Build a column vector \mathbf{r} that contains 20 random numbers between 10 and 15.
- Build a column vector \mathbf{im} that contains 20 random numbers between -1 and 1.
- Build a column vector \mathbf{Z} that contains 20 complex numbers when the real parts are the numbers in \mathbf{r} and the imaginary parts are the numbers in \mathbf{im} . For example if vectors \mathbf{r} and \mathbf{im} are:

$\mathbf{r}=[2, 10]$ and

$\mathbf{im}=[-1, 0.5]$ then vector \mathbf{Z} will be $[2-i, 10+0.5i]$;

- Add to vector \mathbf{Z} two more columns, in the first one calculate and insert the absolute values of the complex numbers and in the second one the angles.
2. Calculate the square product of the following matrix, and of each of its elements (two command lines)

1	2	3
4	5	6
7	8	9

3.

Define x and y as the vectors $x = 2, 4, 6, 8, 10$ and $y = 3, 6, 9, 12, 15$. Then use them in the following expression to calculate z using element-by-element calculations.

$$z = \frac{xy + \frac{y}{x}}{(x+y)^{(y-x)}} + 12^{x/y}$$

4. (from Moshe Brand> HW)

Define an array which includes the next variables:

- x – A row vector with 25 elements. The first element is equal to 23 and the last element is equal to 67. The differences between all the elements are constant.
- y – A column vector which is equal to the sine of x , what are the dimensions of y ?

- c. A – Matrix with 2 rows and 3 columns (randomize values).
- d. B - Matrix with 2 rows and 2 columns (randomize values).
- e. D - Matrix with 2 rows and 2 columns (randomize elements).
- f. G – Addition of two of the above Matrix (choose the suitable matrix).
- g. K – Product of matrixes A and B (can we switch their positions?)
- h. L – Add to Matrix G 55 to all the elements.
- i. M - Matrix with 4 rows and 5 columns. The first 2 rows include matrix A (in the left three columns) and Matrix B (in the right two columns). The 3rd row contains the first five elements of x in a reversed order. The 4th row contains the last five elements of y in the originally order.

A	A	A	B	B
A	A	A	B	B
x	x	x	x	x
y	y	y	y	y

- j. Display the elements of x which are in the odd locations.
 - k. Display the 3rd, 6th, 21st, 9th, 17th elements of y (in this order).
- 5.** Calculate the values of the function $z = 2\sin w * w + 2w^2$ where $0 \leq w \leq 2\pi$.
- You can choose the number of the elements of w (by yourself).