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Homework01: Intro to Matlab

Islamic University of Gaza		Signals & Linear Systems Lab
Faculty of Engineering		HW#1
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Question 1: Compute the following expression using MATLAB

a.
$$\frac{2.4+64/3.5+8.3*12.5^3}{\sqrt{76.4}-28/15}$$

b.
$$(5.9^2 - 2.4^2)/3 + \left(\frac{5}{e^{0.3}}\right)^2$$

c.
$$\frac{14.8^3 - 6.3^2}{(\sqrt{13}+5)^2}$$

Solution:

```
>> (2.4+64/3.5+8.3*12.5^3)/(sqrt(76.4)-28/15)
ans =
    2.3613e+03
>> (5.9^2-2.4^2)/3+(5/2.71^0.3)^2
ans =
    23.4288
>> (14.8^3 - 6.3^2)/(sqrt(13)+5)^2
ans =
    43.2392
>>
```

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Question 2: Create the variables to represent the following matrices:

$$A = \begin{bmatrix} 12 & 17 & 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 8 & 3 \\ 1 & 2 & 3 \\ 2 & 4 & 6 \end{bmatrix} \quad C = \begin{bmatrix} 22 \\ 17 \\ 4 \end{bmatrix}$$

- Assign to the variable x1 the value of the second column of matrix A.
- Assign to the variable x2 the third column of matrix B.
- Assign to the variable x3 the third row of matrix B.
- Assign to the variable x4 the first three values of matrix A as the first row, and all the values in matrix B as the second, third and fourth rows, and transposed of C as fifth row.

```
Command Window
A =
    12    17     3     4

>> B = [5 8 3; 1 2 3; 2 4 6]

B =
     5     8     3
     1     2     3
     2     4     6

>> C=[22;17;4]

C =
    22
    17
     4
```

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Command Window

```
>> X1 = A(1,2)
```

```
X1 =
```

```
17
```

```
>> X2 = B(:,3)
```

```
X2 =
```

```
3
```

```
3
```

```
6
```

```
>> X3 = B(3,:)
```

```
X3 =
```

```
2
```

```
4
```

```
6
```

```
>> X4 = [A(:, [1 2 3]);B;C']
```

```
X4 =
```

```
12    17     3
```

```
5      8     3
```

```
1      2     3
```

```
2      4     6
```

```
22    17     4
```

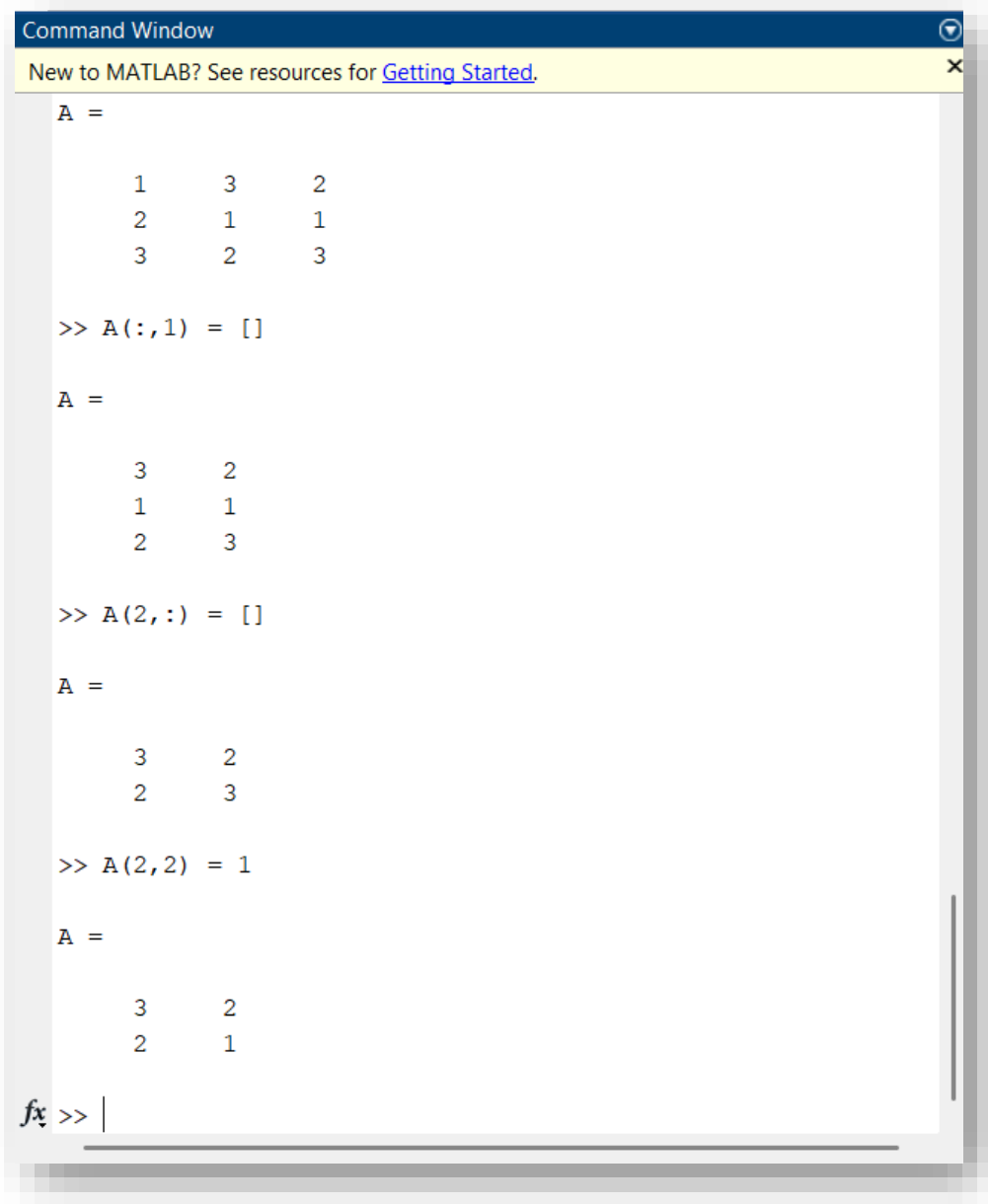
```
fx >>
```

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Question 3:

If matrix A is defined using the MATLAB code `A = [1 3 2; 2 1 1; 3 2 3]`, which command will produce the following matrix?

$$B = \begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$$



```
Command Window
New to MATLAB? See resources for Getting Started.
A =
     1     3     2
     2     1     1
     3     2     3

>> A(:,1) = []

A =
     3     2
     1     1
     2     3

>> A(2,:) = []

A =
     3     2
     2     3

>> A(2,2) = 1

A =
     3     2
     2     1

fx >> |
```

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Question 4: create to matrix A and B then answer the following question

$$A = \begin{bmatrix} 1 & 3 & 2 \\ 0 & 5 & 1 \\ 4 & 2 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 0 & 4 \\ 1 & 5 & 2 \\ 2 & 4 & 3 \end{bmatrix}$$

a- $C = A*B$.

```
A =  
     1     3     2  
     0     5     1  
     4     2     3  
  
>> B = [2 0 4; 1 5 2; 2 4 3]  
  
B =  
     2     0     4  
     1     5     2  
     2     4     3  
  
>> C = A*B  
  
C =  
     9     23     16  
     7     29     13  
    16     22     29
```

b- Inverse of matrix A.

```
>> A^-1  
  
ans =  
  
    -0.8667    0.3333    0.4667  
    -0.2667    0.3333    0.0667  
     1.3333   -0.6667   -0.3333
```

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c- Sum first row of matrix B.

```
>> B(1,1) + B(1,2) + B(1,3)

ans =

    6
```

d- Delete second column of matrix A.

```
>> A(:,2) = []

A =

     1     2
     0     1
     4     3
```

e- Add matrix $D = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 6 & 7 \end{bmatrix}$ to matrix A.

```
>> D = [2 3; 4 5; 6 7]

D =

     2     3
     4     5
     6     7

>> [A D]

ans =

     1     2     2     3
     0     1     4     5
     4     3     6     7
```