Name: Mulia Widjaja
Lab Number: 1
Class: ELEN 50L
Date: 9/28/2022
Section time: Monday at 2:15 PM – 5:00 PM

Work to be submitted 1:

```
(3.7*4+3*5+2.3*3)/(4+5+3)
```

Result:
```
>> Lab1_1

ans =

    3.0583
```

Work to be submitted 2:

```
a=[0:2*pi/20:2*pi-2*pi/20];
cos(a)
```

```
ans =

  Columns 1 through 9

    1.0000    0.9511    0.8090    0.5878    0.3090    0.0000   -0.3090   -0.5878   -0.8090

  Columns 10 through 18

   -0.9511   -1.0000   -0.9511   -0.8090   -0.5878   -0.3090   -0.0000    0.3090    0.5878

  Columns 19 through 20

    0.8090    0.9511
```

Work to be submitted 3:

- f(t):

```
t = [0:100]
plot(t, exp(-t), linewidth=1.5);

title('f = exp(-t)');
xlim([0, 100]);
xticks([0:10:100]);
Labels = string([0:10:100]);
xticklabels(Labels);
```
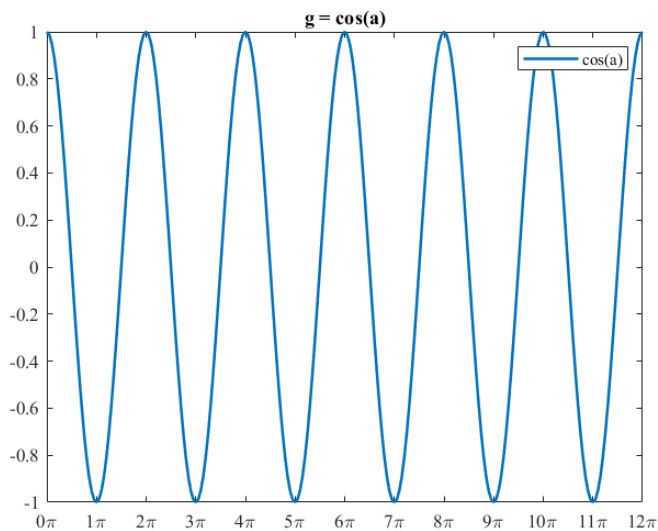
```
set(findall(gca, '-Property', 'FontName'), 'FontName', 'Times New Roman');
legend("exp(-t)");
```
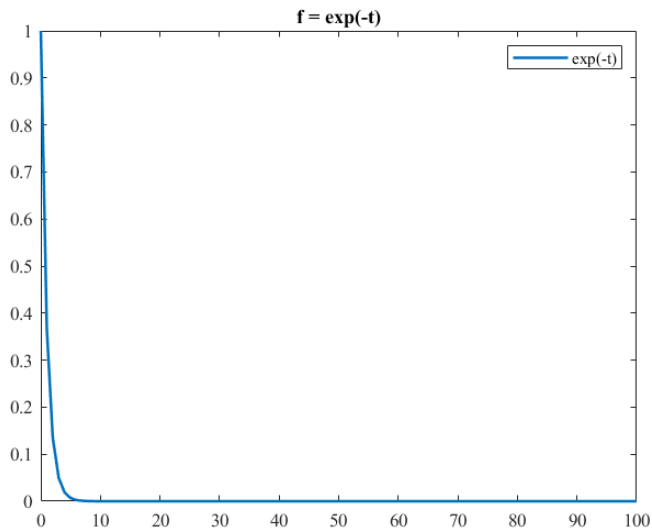

- g(a):

```
a = pi*[0:0.05:12];
ticksArray = [0:12];
plot(a, cos(a), linewidth=1.5);

title('g = cos(a)');
xlim(pi*[0, 12]);
xticks(pi*ticksArray);
Labels = string(ticksArray) + "\pi";
xticklabels(Labels);
set(findall(gca, '-Property', 'FontName'), 'FontName', 'Times New Roman');
legend("cos(a)");
```

Work to be submitted 4:

```matlab
syms x;
f = (exp(-3*x) + 10*sin(x+1))/cos(x+1);
Df = diff(f, x)

g = exp(-2*x)/(1+exp(-2*x));
Dg = diff(g, x)

h = -4*x^2;
Ih = int(h, x, [-2, 2])
```

```
Df =

(10*cos(x + 1) - 3*exp(-3*x))/cos(x + 1) + (sin(x + 1)*(exp(-3*x) + 10*sin(x + 1)))/cos(x + 1)^2


Dg =

(2*exp(-4*x))/(exp(-2*x) + 1)^2 - (2*exp(-2*x))/(exp(-2*x) + 1)


Ih =

-64/3
```

Work to be submitted 5:

```matlab
A = [ 2,1; 3,2]
B = [ 3,1; 2,2]

A1 = A * B,
A2 = B * A
A3 = (A'* B')'
A4 = (B' * A')'

A5 = inv (A * B)
A6 = inv(A) * inv(B)
A7 = inv (B * A)
A8 = inv(B) * inv(A)

disp("A1*(A*B) ="+newline)
disp(A1*(A*B))

disp("(A*B)*A1 ="+newline)
disp((A*B)*A1)
```

```
>> Lab1_5

A =

     2     1
     3     2


B =

     3     1
     2     2

     2     3
     1     2

     3     2
     1     2
```

```
A1 =                    A5 =

     8     4                  1.7500   -1.0000
    13     7                 -3.2500    2.0000


A2 =                    A6 =

     9     5                  1.5000   -1.2500
    10     6                 -2.5000    2.2500


A3 =                    A7 =
                                                        A1*(A*B) =
     9     5                  1.5000   -1.2500
    10     6                 -2.5000    2.2500              116    60
                                                           195   101


A4 =                    A8 =                         (A*B)*A1 =

     8     4                  1.7500   -1.0000             116    60
    13     7                 -3.2500    2.0000             195   101
```

Work to be submitted 6:

```
C = [1 0 1; 3 3 4; 2 2 3];
S = [10;12;5];

V = inv(C)*S;

disp("C*V ="+newline)
disp(C*V)

disp("S ="+newline)
disp(S)
```

```
C*V =

    10.0000
    12.0000
     5.0000


S =

    10
    12
     5
```

Work to be submitted 7:

```
syms Va Vb Vc Vd;

Vs = 12;
Is1 = 0.004;
Is2 = 0.002;
R1 = 1000;
R2 = 1000;
R3 = 1000;
R4 = 1000;
R5 = 1000;
R6 = 1000;

eq1 = -Is1 + (Va-Vb)/R1 + (Vd-Vc)/R2 + Vd/R5 + Vd*(R3+R6) == 0;
eq2 = (Vb-Va)/R1 + Is2 + Vc/R4 + (Vc-Vd)/R2 == 0;
eq3 = Vc-Vb == Vs;
eq4 = Vd-Va == 2*Vc;

eqns = [eq1, eq2, eq3, eq4];
vars = [Va, Vb, Vc, Vd];

[C, S] = equationsToMatrix(eqns, vars)
```

```
V = inv(C) * S
```

C =

```
[ 1/1000,  -1/1000,  -1/1000,  1000001/500]
[-1/1000,   1/1000,    1/500,      -1/1000]
[      0,       -1,        1,            0]
[     -1,        0,       -2,            1]
```

S =

```
  1/250
 -1/500
    12
     0
```

V =

```
 -4
-10
  2
  0
```