LOOPING

Terdapat **for** dan **while do** dalam MATLAB

```
% Looping for kondisi 1
for i = 1:5
    p = i^2
end

% Looping for kondisi 2
for j = 1:0.5:5
    q = j/2
end
```

```
p = 0;
while(p <= 10)
    q = p^2 + p
    p = p + 1;
end
```

DIFFERENSIAL

differensial.m

```
1 -    f = input('Masukkan bentuk persamaan f(x) = ');
2 -    f_asli = sym (f)
3 -    f_turunan = diff(f_asli,'x')
4
```

Command Window

```
>> syms x
>> differensial
Masukkan bentuk persamaan f(x) = x.^2 + 3*x + 4

f_asli =

x^2 + 3*x + 4


f_turunan =

2*x + 3
```

INTEGRAL

integral.m

```
1 -    f = input('Fungsi = ');
2 -    f_asli = sym (f)
3 -    f_integral = int(f_asli,'x')
```

Command Window

```
>> syms x
>> integral
Fungsi = sin(3*x) - 2*x.^3

f_asli =

sin(3*x) - 2*x^3


f_integral =

- cos(3*x)/3 - x^4/2
```

FUNCTION

func.m

```
1 function func(param)
2     fprintf('Nama saya %s!\n',param)
3 end
```

```
>> func('Zufar')
Nama saya Zufar!
```

Function berada di file terpisah dan workspace yang sama

FUNCTION

Beberapa fungsi dapat didefinsikan dalam satu file, tetapi:

- Hanya fungsi paling atas yang bersifat global (dapat dipanggil dari mana saja)
- Fungsi yang lain bersifat lokal (hanya bisa dipanggil oleh sesama fungsi)

func.m

```
1  function func(param)
2    callname(param)
3    fprintf('Nama saya %s!\n',param)
4  end
5
6  function callname (param)
7    fprintf('Kata \"%s\" diawali dengan huruf %c.\n',param,param(1))
8  end
```

```
>> func('Zufar')
Kata "Zufar" diawali dengan huruf Z.
Nama saya Zufar!
>> callname('Zufar')
error: 'callname' undefined near line 1, column 1
```

FUNCTION

doubleit.m

```
1  function result = doubleit(param)
2    result = 2*param;
3  end
```

```
>> doubleit(3)
ans = 6
>> doubleit([3 4])
ans =

   6   8
```

multi.m

```
1  function [mult2,mult3] = multi(param1,param2)
2    mult2=param1*2;
3    mult3=param2*3;
4  end
```

```
>> [a,b]=multi(4,5)
a = 8
b = 15
```

ANONYMOUS FUNCTION

```
>> squared = @(x) x.^2
squared =

@(x) x .^ 2

>> squared(3)
ans = 9
>> squared(1:3)
ans =

   1   4   9
```

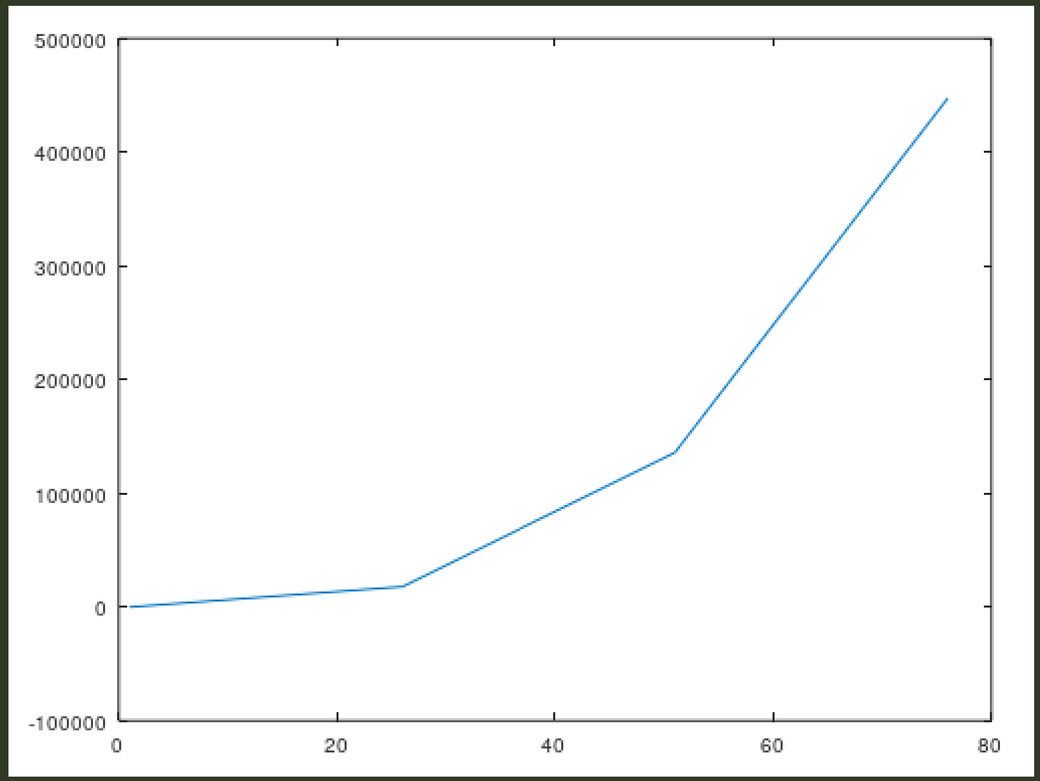
```
>> addition = @(x,y) x+y
addition =

@(x, y) x + y

>> addition(3,4)
ans = 7
```

GRAFIK

Grafik Garis 2D

```
x=1:25:100;
y=x.^3+2*x.^2-40*x;
x,y
plot(x,y)
```

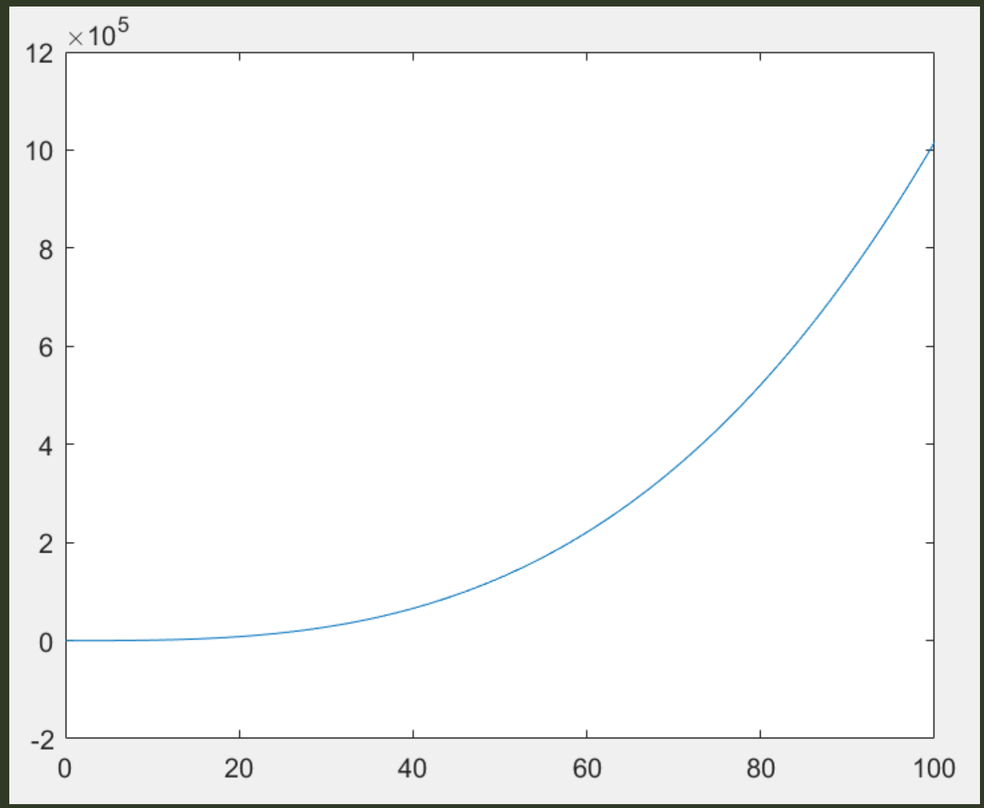
```
x =

     1    26    51    76

y =

      -37    17888   135813   447488
```



GRAFIK

Grafik Garis 2D

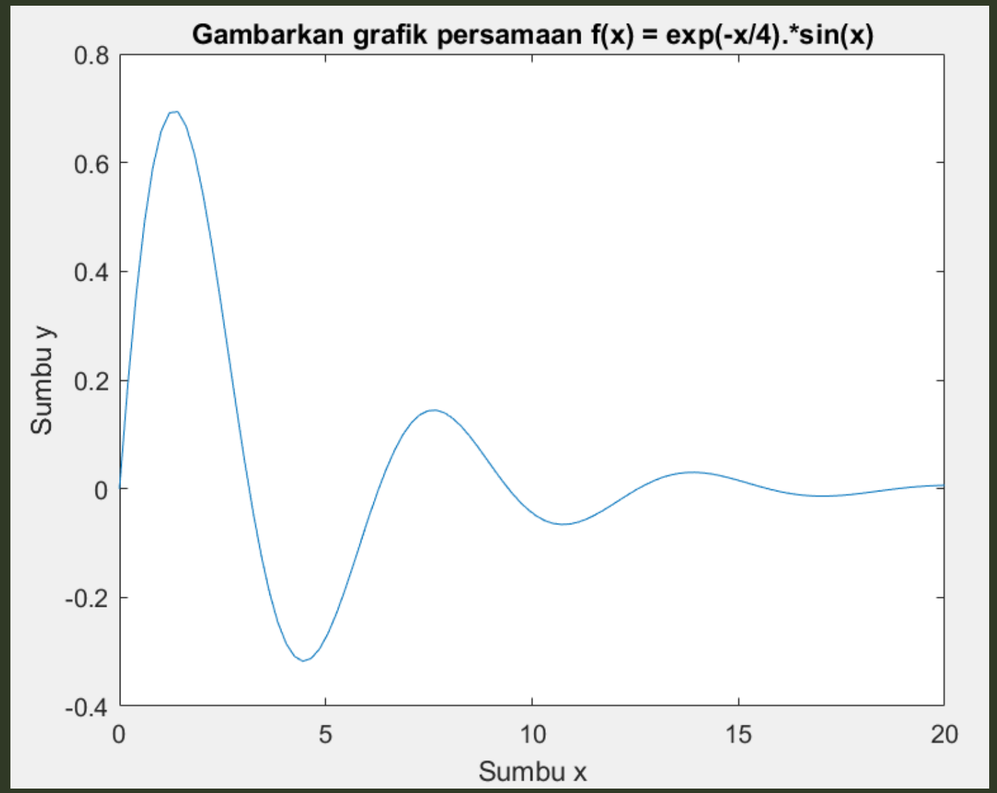
```
x = 0:1:100;
y = x.^3 + 2*x.^2 - 40*x;
plot(x,y);
```



GRAFIK

Grafik Garis 2D

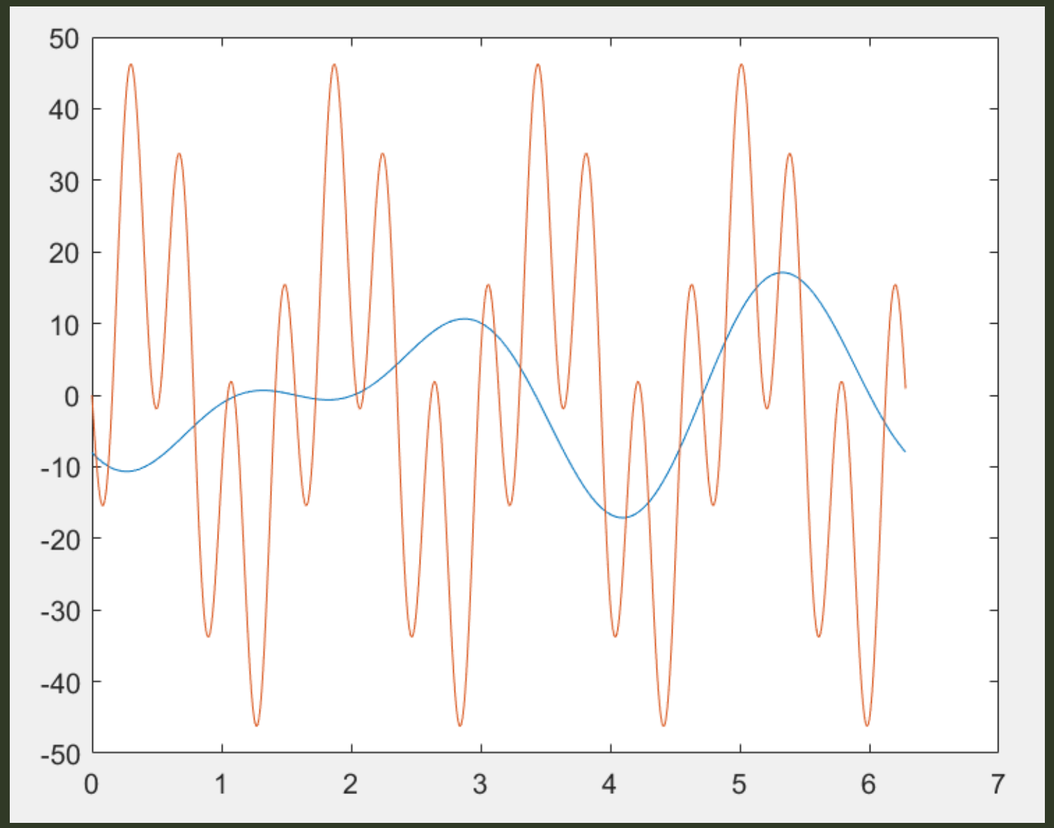
```
x = linspace(0,20);
y = exp(-x/4).*sin(x);
plot(x,y);
xlabel('Sumbu x');
ylabel('Sumbu y');
title('Gambarkan grafik persamaan f(x) = exp(-x/4).*sin(x)');
```



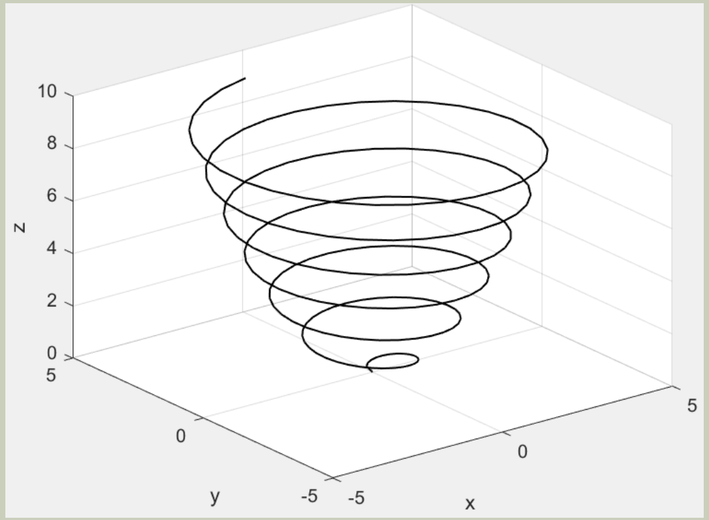
GRAFIK

Grafik Garis 2D

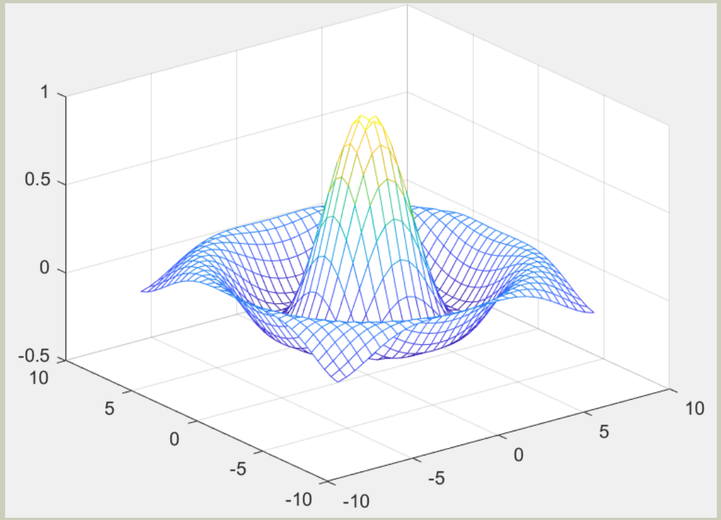
```
x = 0:0.01:2*pi;
y = -10*sin(2*x) - 8*cos(3*x);
z = 8*sin(6*x).*-6.*cos(10*x);
plot(x,y,x,z);
```



GRAFIK

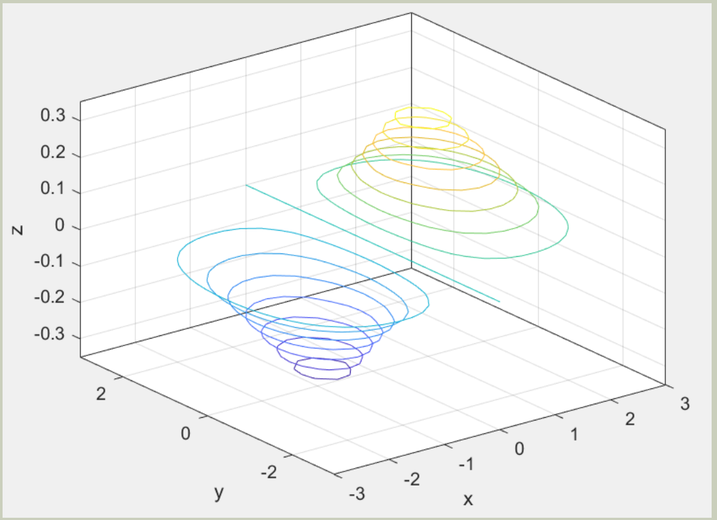


3D Plot



Mesh

Plot



Contour

Plot

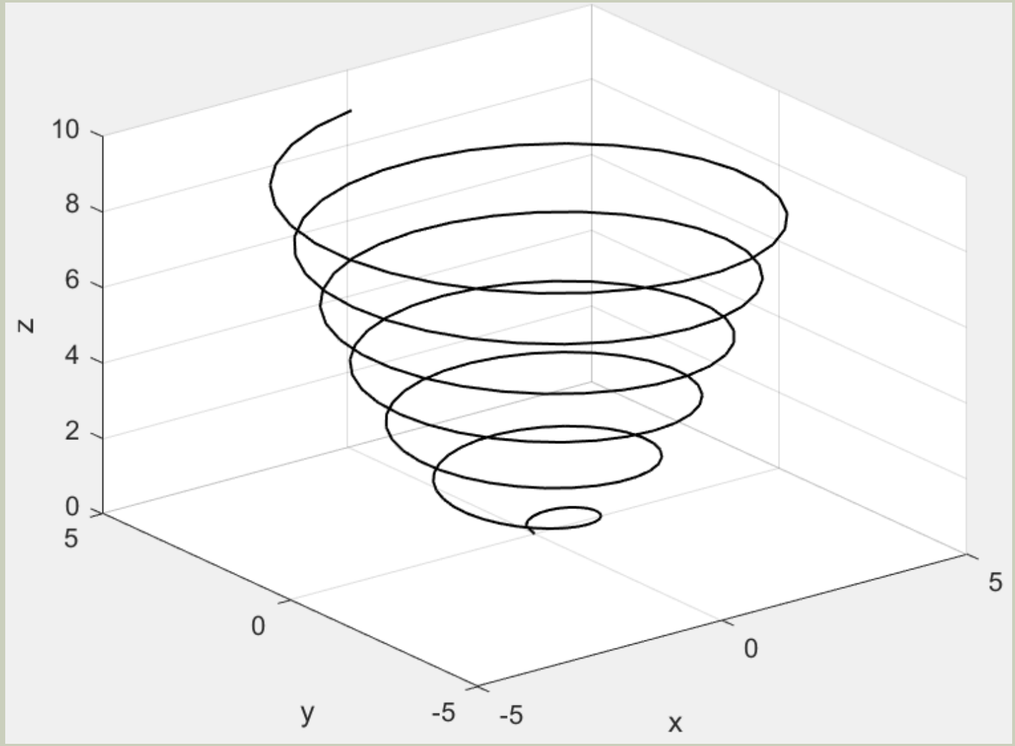
dan lain

sebagainya...

GRAFIK

Grafik Garis 3D : **LINE PLOT**

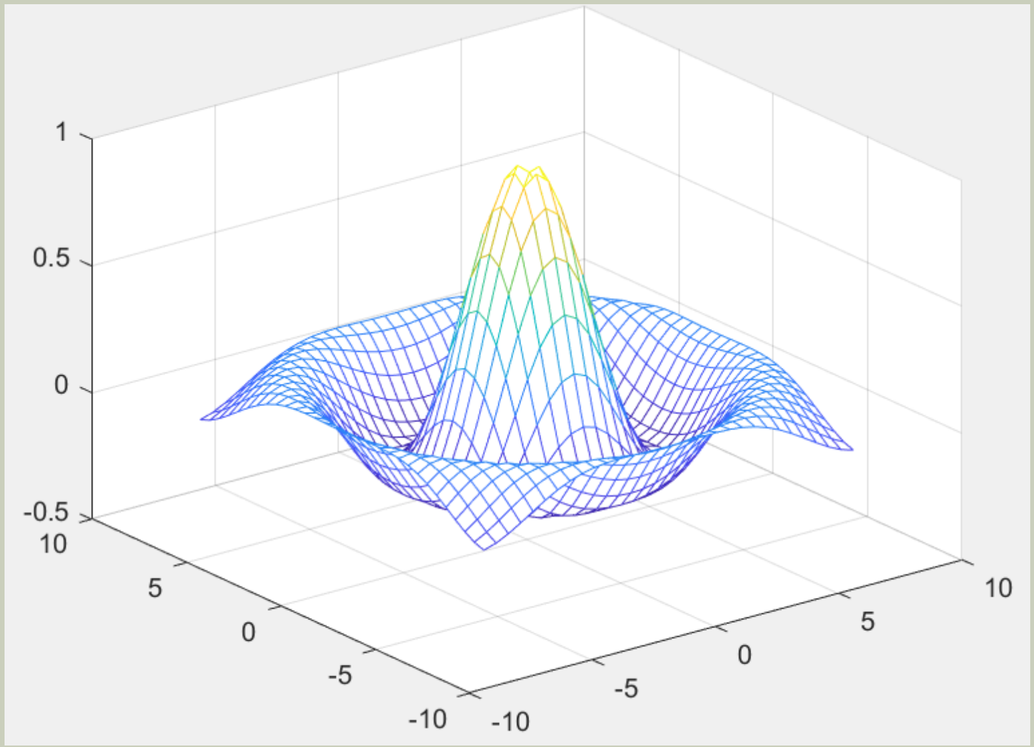
```
t = 0:0.1:6*pi;
x = sqrt(t).*sin(2*t);
y = sqrt(t).*cos(2*t);
z = 0.5*t;
plot3(x,y,z,'k','linewidth',1)
grid on
xlabel('x'); ylabel('y'); zlabel('z');
```



GRAFIK

Grafik Garis 3D : **MESH PLOT**

```
x = -7.5:0.5:7.5;
y = x;
[X,Y] = meshgrid(x,y);
R = sqrt(X.^2 + Y.^2);
Z = sin(R)./R;
mesh(X,Y,Z);
```



GRAFIK

Grafik Garis 3D : **CONTOUR PLOT**

```
x = -3:0.25:3;
y = -3:0.25:3;
[X,Y] = meshgrid(x,y);
Z = 1.8.^(-1.5*sqrt(X.^2 + Y.^2)).*cos(0.5*Y).*sin(X);
contour3(X,Y,Z,15)
xlabel('x'); ylabel('y')
zlabel('z')
```