

Plotting in Matlab

- First, you need some data to plot

```
x=[0 1 2 3 4 5];
```

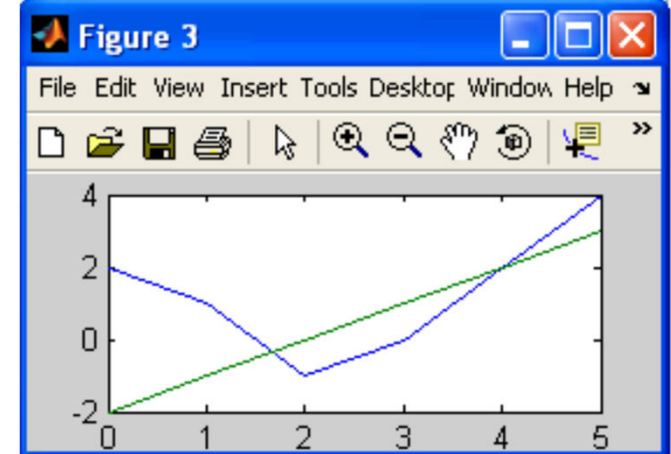
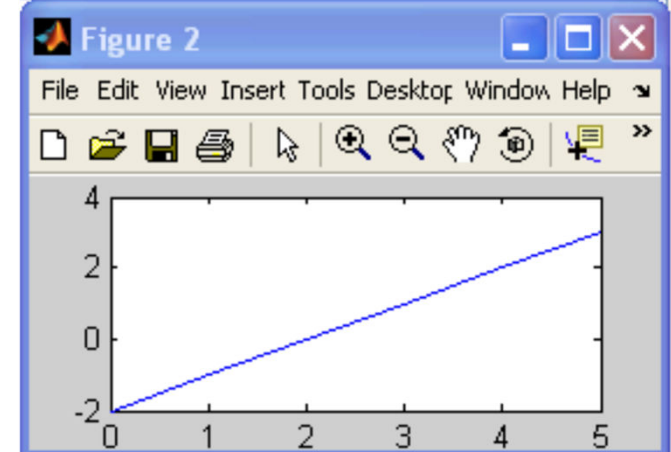
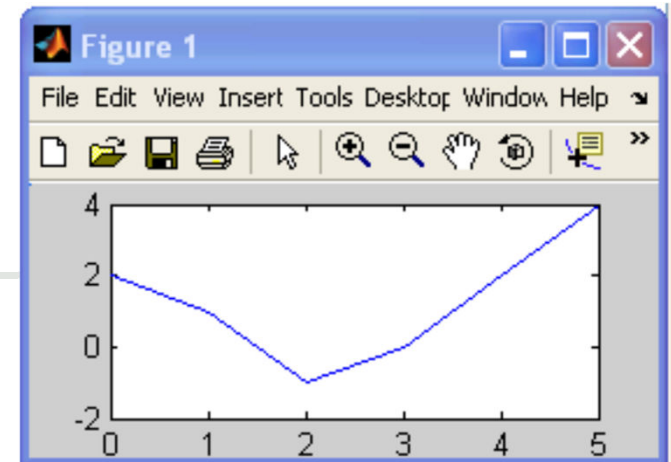
```
y=[2 1 -1 0 2 4];
```

```
z=[-2 -1 0 1 2 3];
```

```
figure; plot(x,y)
```

```
figure; plot(x,z)
```

```
figure; plot(x,y,x,z)
```



Plotting a function

- You have the function: $y = x^3 - 100x^2$

First, you need some values for x:

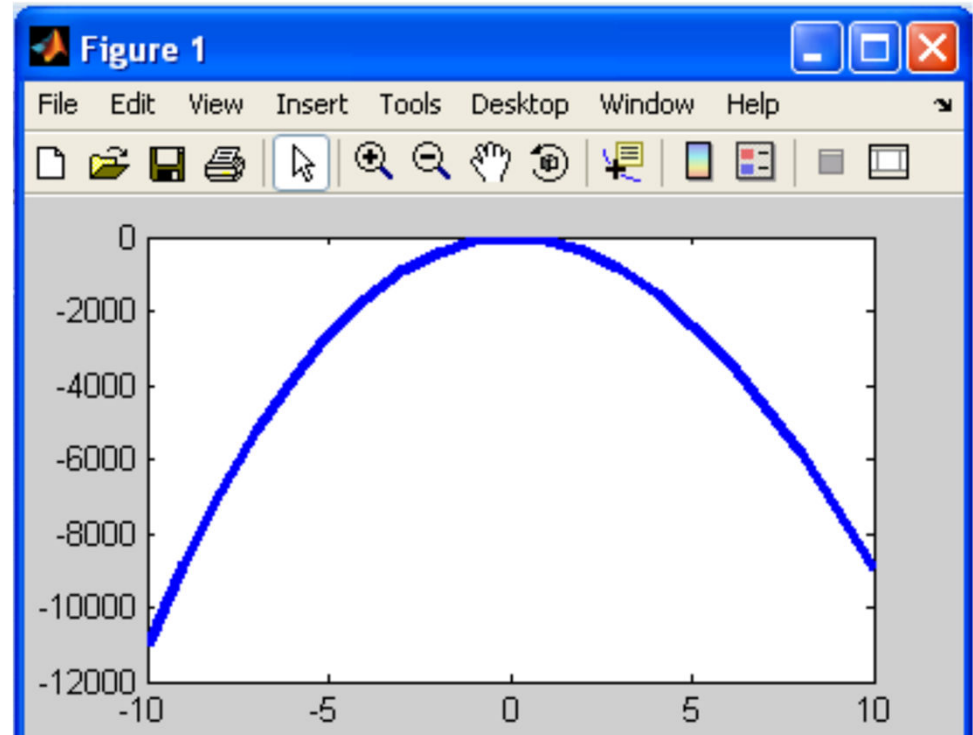
```
x=-10:1:10;
```

Then you can define y:

```
y=x.^3-100*x.^2;
```

Now you can plot:

```
figure; plot(x,y)
```



Adding title and axis labels

```
clc, clear, close all
```

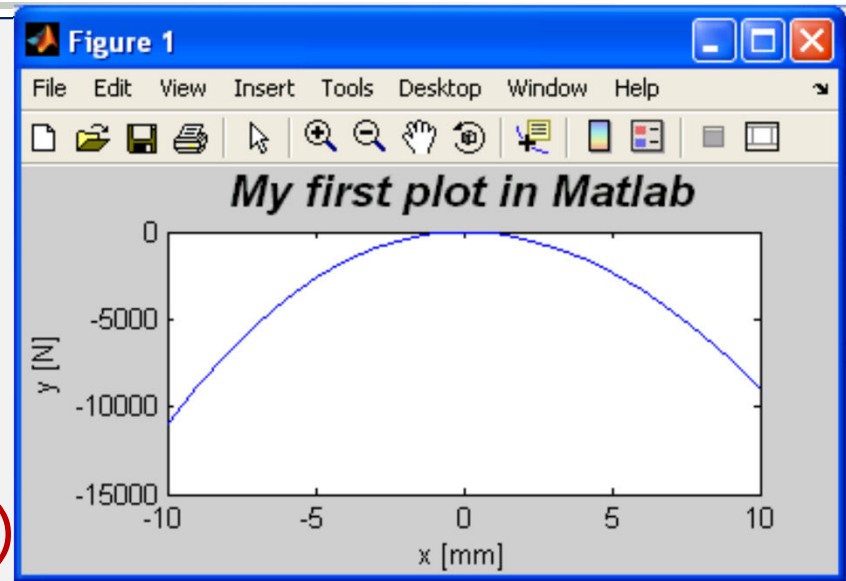
```
x=-10:1:10;
```

```
y=x.^3-100*x.^2;
```

```
figure; plot(x,y);
```

```
xlabel('x [mm]'); ylabel ('y [N]')
```

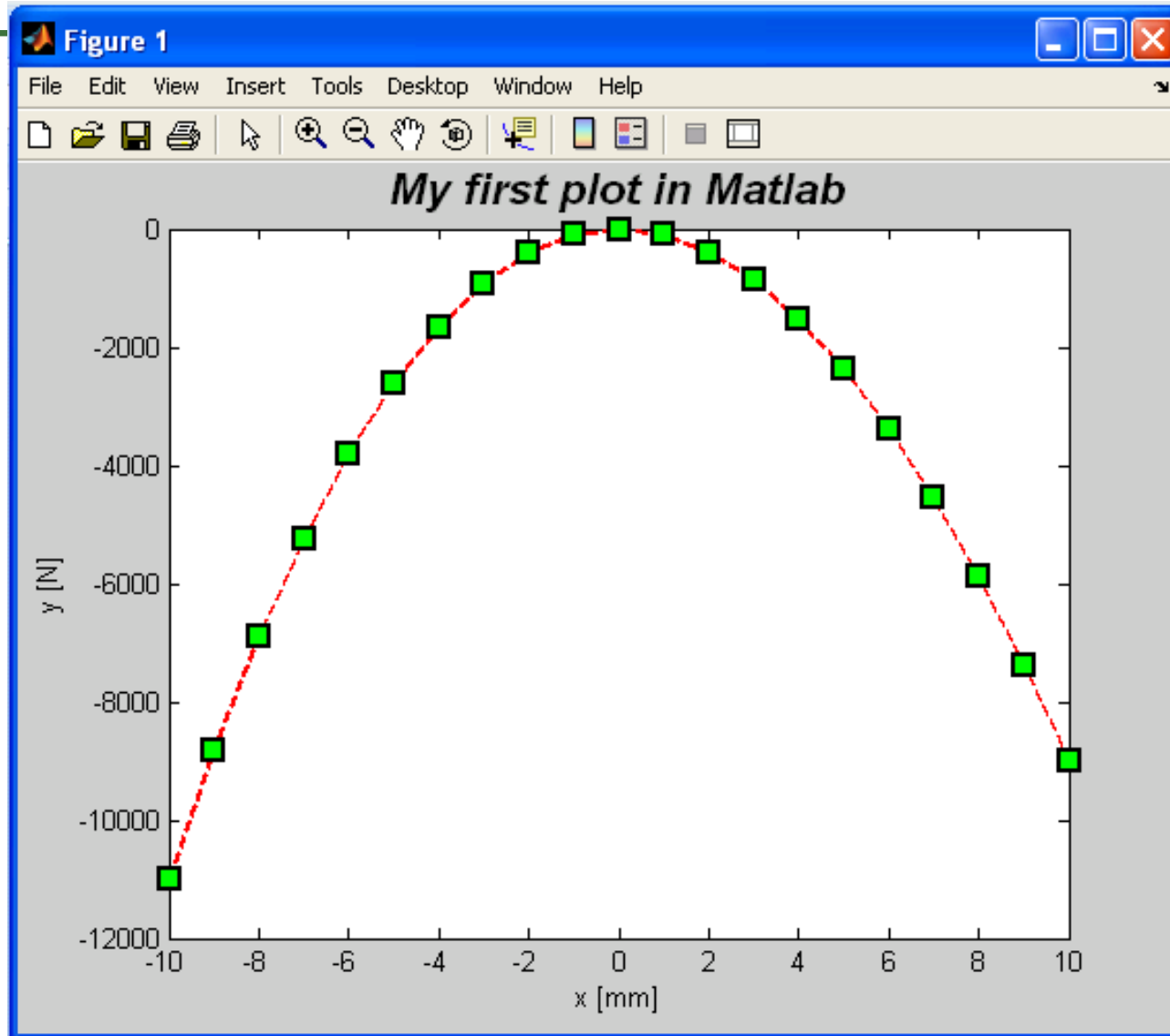
```
title('My first plot in Matlab','FontSize',16,  
      'FontWeight','bold', 'FontAngle','italic');
```



Specifying lines and markers

```
x=-10:1:10;  
y=x.^3-100*x.^2;  
figure; plot(x,y, '--rs','LineWidth',2,...  
            'MarkerEdgeColor','k',...  
            'MarkerFaceColor','g',...  
            'MarkerSize',10);  
xlabel('x [mm]'); ylabel ('y [N]')  
title('My first plot in Matlab','FontSize',16,  
      'FontWeight','bold', 'FontAngle','italic');
```

Adding title and axis labels



Adding title and axis labels

Marker Specifier	Description
+	Plus sign
o	Circle
*	Asterisk
.	Point
x	Cross
'square' or s	Square
'diamond' or d	Diamond
^	Upward-pointing triangle
v	Downward-pointing triangle
>	Right-pointing triangle
<	Left-pointing triangle
'pentagram' or p	Five-pointed star (pentagram)
'hexagram' or h	Six-pointed star (hexagram)
none	No marker (default)

RGB Value	Short Name	Long Name
[1 1 0]	y	yellow
[1 0 1]	m	magenta
[0 1 1]	c	cyan
[1 0 0]	r	red
[0 1 0]	g	green
[0 0 1]	b	blue
[1 1 1]	w	white
[0 0 0]	k	black

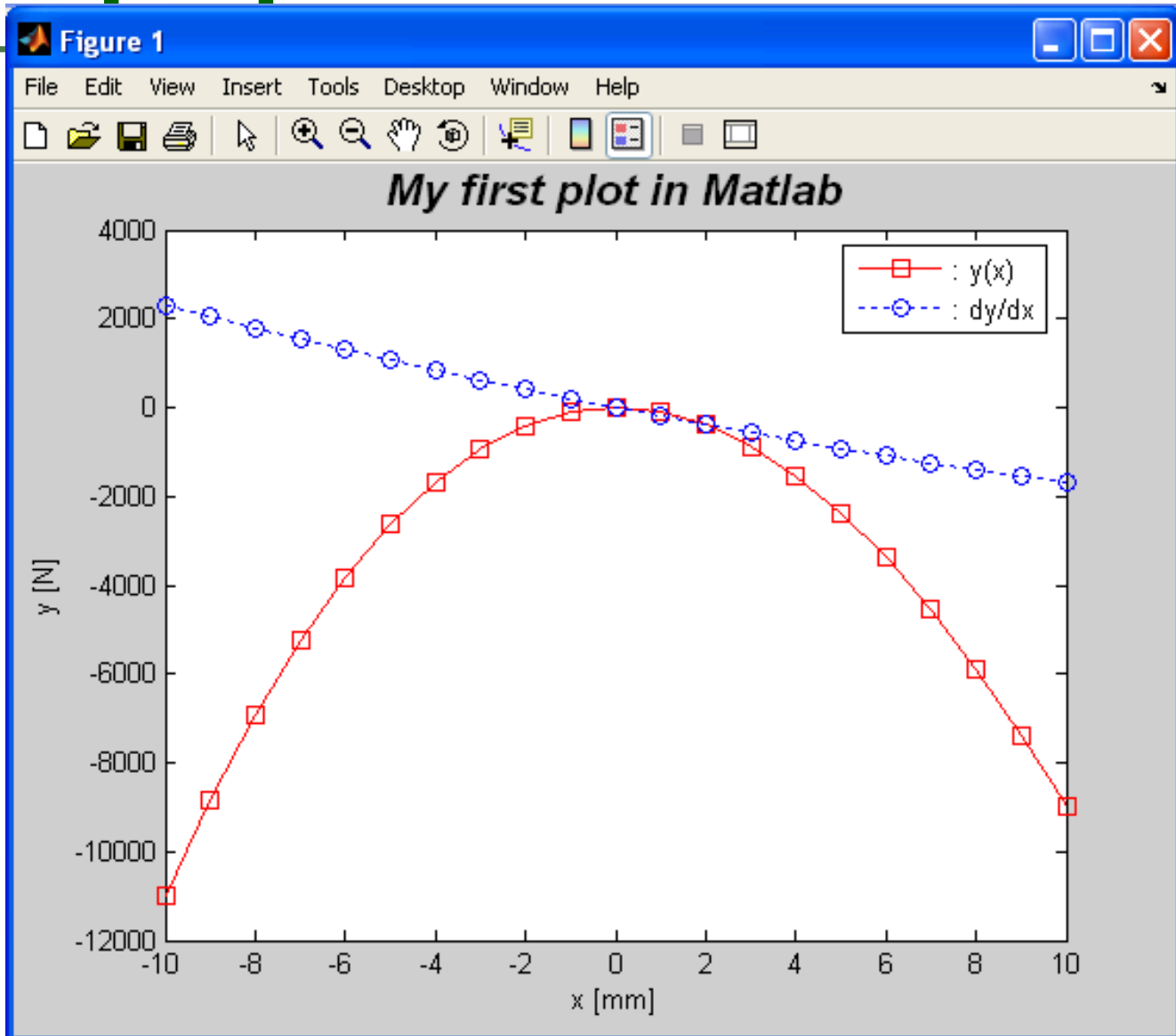
Multiple plots

- Let's also plot dy/dx

```
x=-10:1:10;  
y=x.^3-100*x.^2;  
dydx =3*x.^2-200*x;  
figure;plot(x,y,'-rs',x,dydx,':bo');  
xlabel('x [mm]'); ylabel ('y [N]')  
title('My first plot in Matlab',  
'FontSize',16,'FontWeight','bold', 'FontAngle','italic');  
legend(': y(x)', ': dy/dx')
```

$$y = x^3 - 100x^2$$
$$\frac{dy}{dx} = 3x^2 - 200x$$

Multiple plots

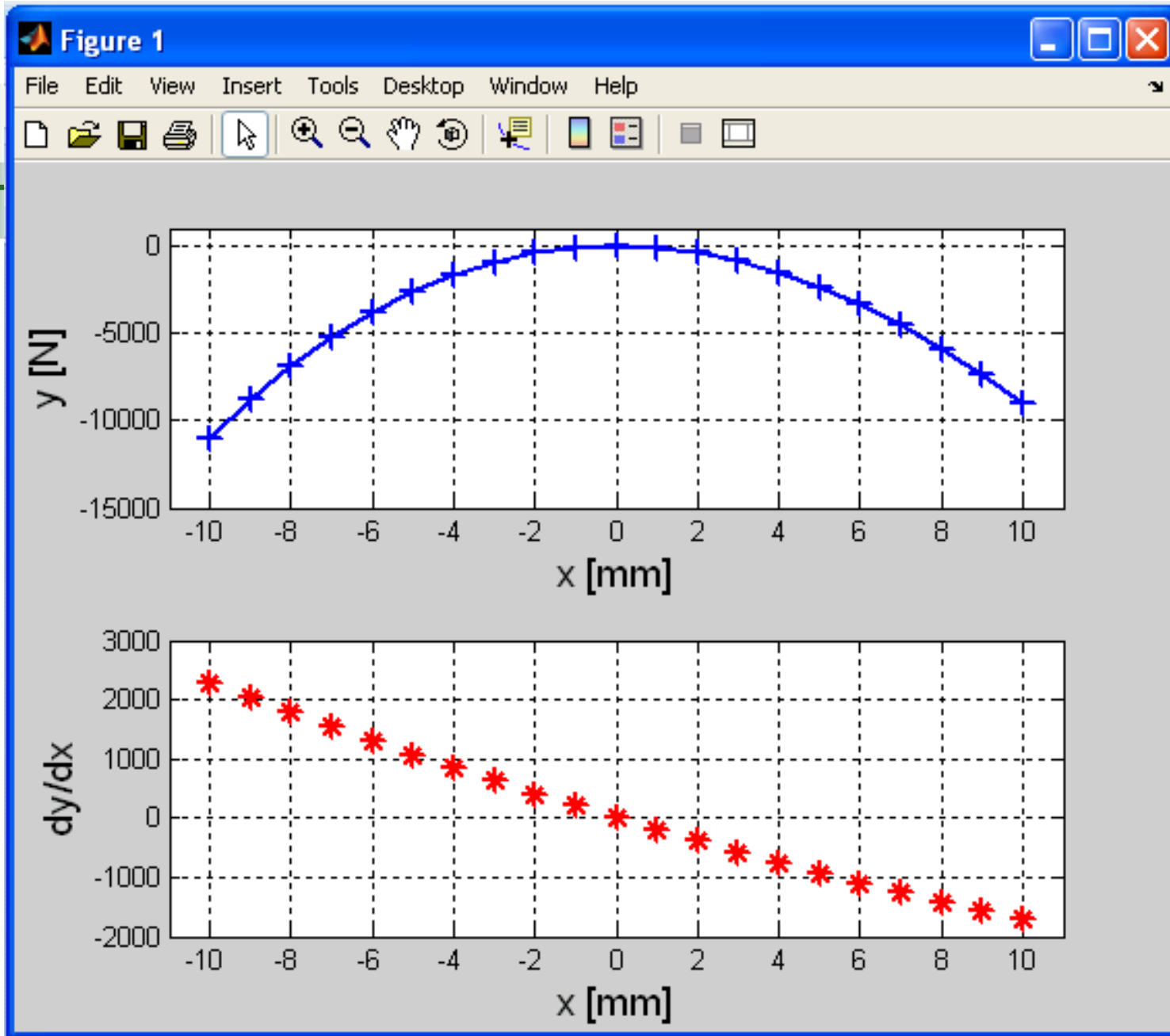


Multiple plots (alt)

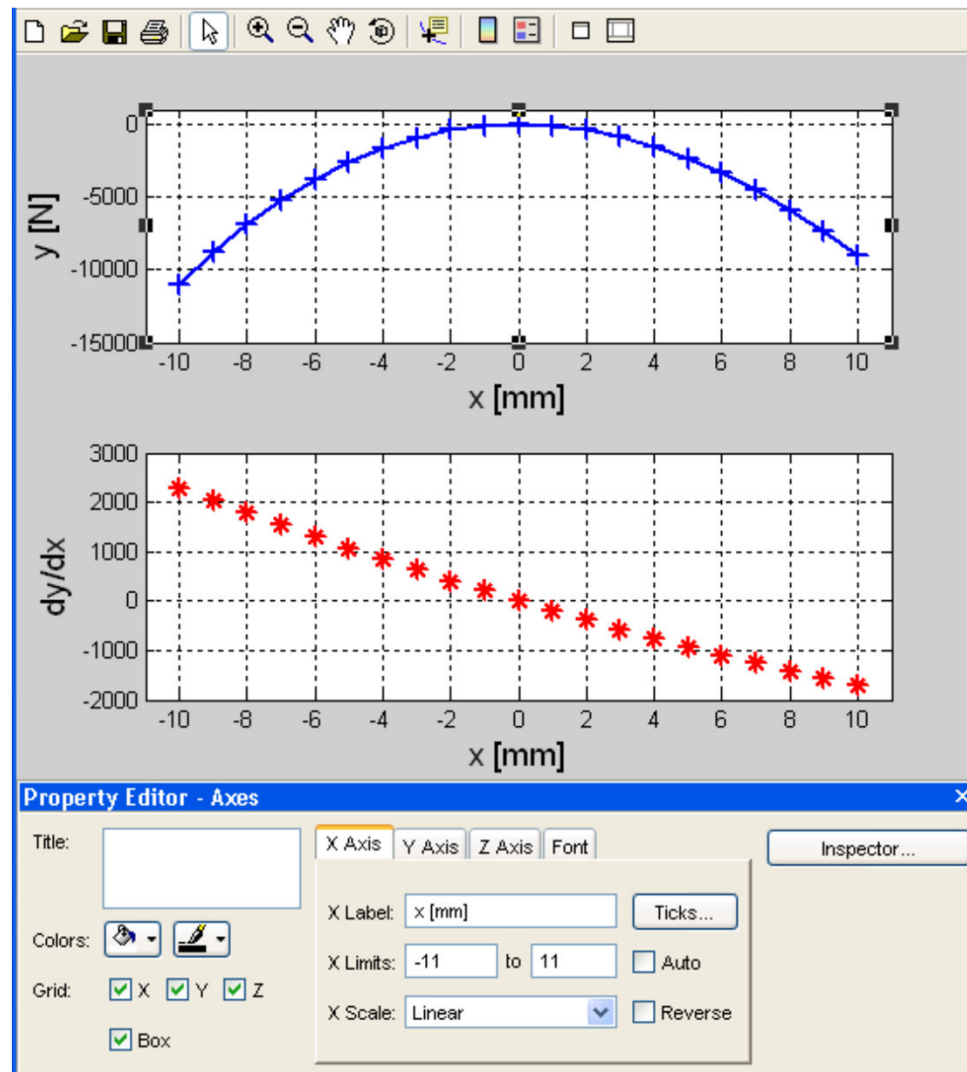
```
figure;
```

```
subplot(2,1,1); plot(x,y,'-b+', 'LineWidth',2, 'MarkerSize',10);  
xlabel('x [mm]', 'FontSize', 14); ylabel ('y [N]', 'FontSize', 14)  
xlim([-11 11]); ylim([-15000 1000]); grid on
```

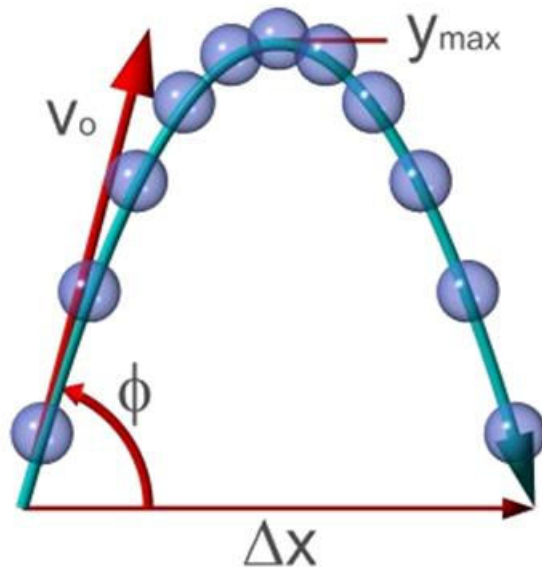
```
subplot(2,1,2); plot(x,dydx,'r*', 'LineWidth',2, 'MarkerSize',10);  
xlabel('x [mm]', 'FontSize', 14); ylabel ('dy/dx', 'FontSize', 14)  
xlim([-11 11]); grid on
```



Editing a plot from the GUI



Movimiento Parabólico



$$V_{ox} = v_o \cos(\phi)$$

$$x(t) = x_o + v_{ox} t$$

$$V_{oy} = v_o \sin(\phi)$$

$$y = y_o + v_{oy} t + \frac{1}{2} a t^2$$

$$a = -g$$

Escriba un programa que grafique x vs t , y vs t , y vs x , entre dos tiempos t_o y t_f especificados por el usuario. El usuario también debe especificar Δt , v_o , x_o , y_o , Φ

La siguiente serie se puede usar para estimar el $\ln(x)$:

$$\ln(x) = (x - 1) - \frac{1}{2}(x - 1)^2 + \frac{1}{3}(x - 1)^3 - \frac{1}{4}(x - 1)^4 \dots \quad 2 \geq x > 0$$

Escriba un programa que le pregunte al usuario el valor de x y el número de términos. El output del programa debe ser una figura con 2 graficas: una mostrando como cambia el estimado de $\ln(x)$ con cada termino y otra mostrando como cambia el error.