

Scilab has a very important and useful in-built function `ode()` which can be used to evaluate an ordinary differential equation or a set of coupled first order differential equations.

The syntax is as follows:

`y=ode(y0,x0,x,f)`

where,

`y0`=initial value of `y`

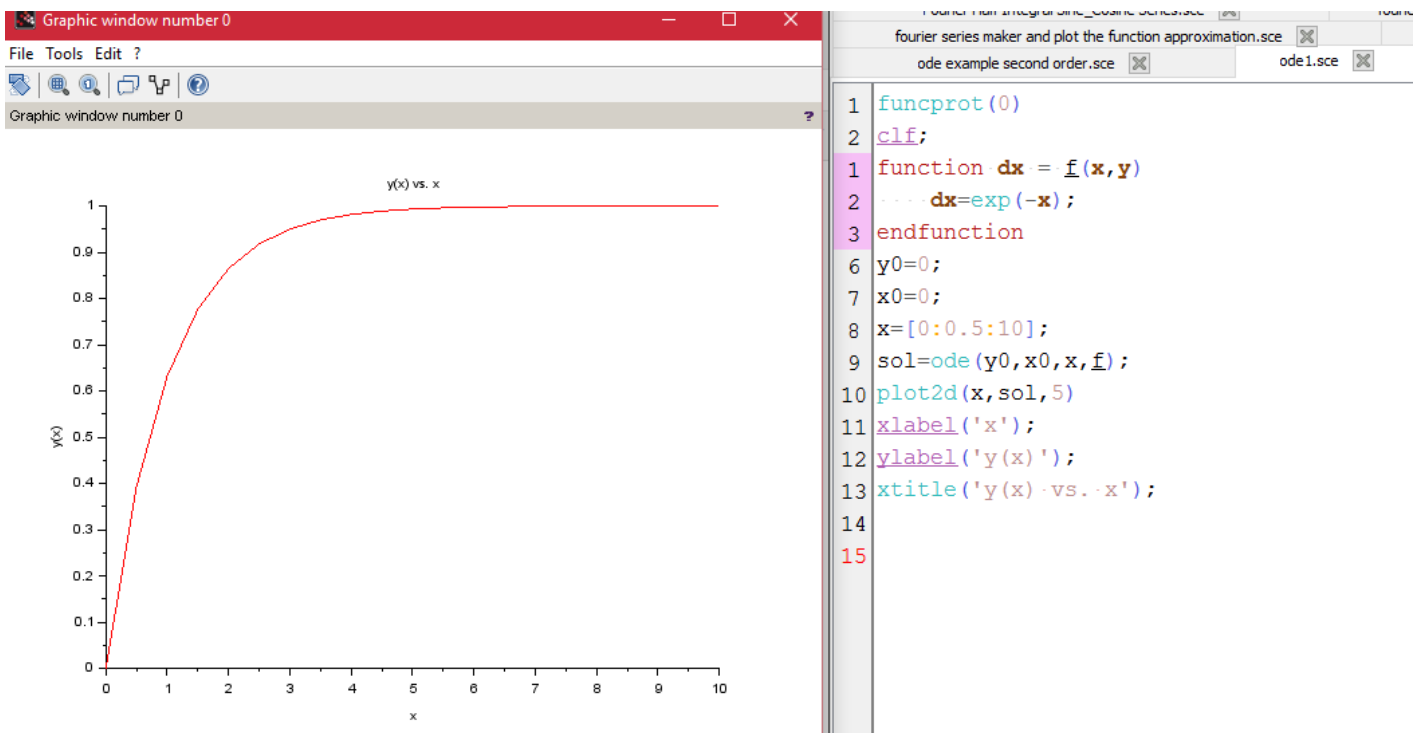
`x0`=initial value of `x`=value of `x` at which you want to calculate `y`.

The following examples illustrate the use of the `ode` to solve a given differential equation:

#1: $\frac{dy}{dx} = e^{-x}$ with $y = 0$ for $x = 0$

```
funcprot(0)
clf;
function dx=f(x, y)
    dx=exp(-x);
endfunction
y0=0;
x0=0;
x=[0:0.5:10];
sol=ode(y0,x0,x,f);
plot2d(x,sol,5)
xlabel('x');
ylabel('y(x)');
xtitle('y(x) vs. x');
```

Output:



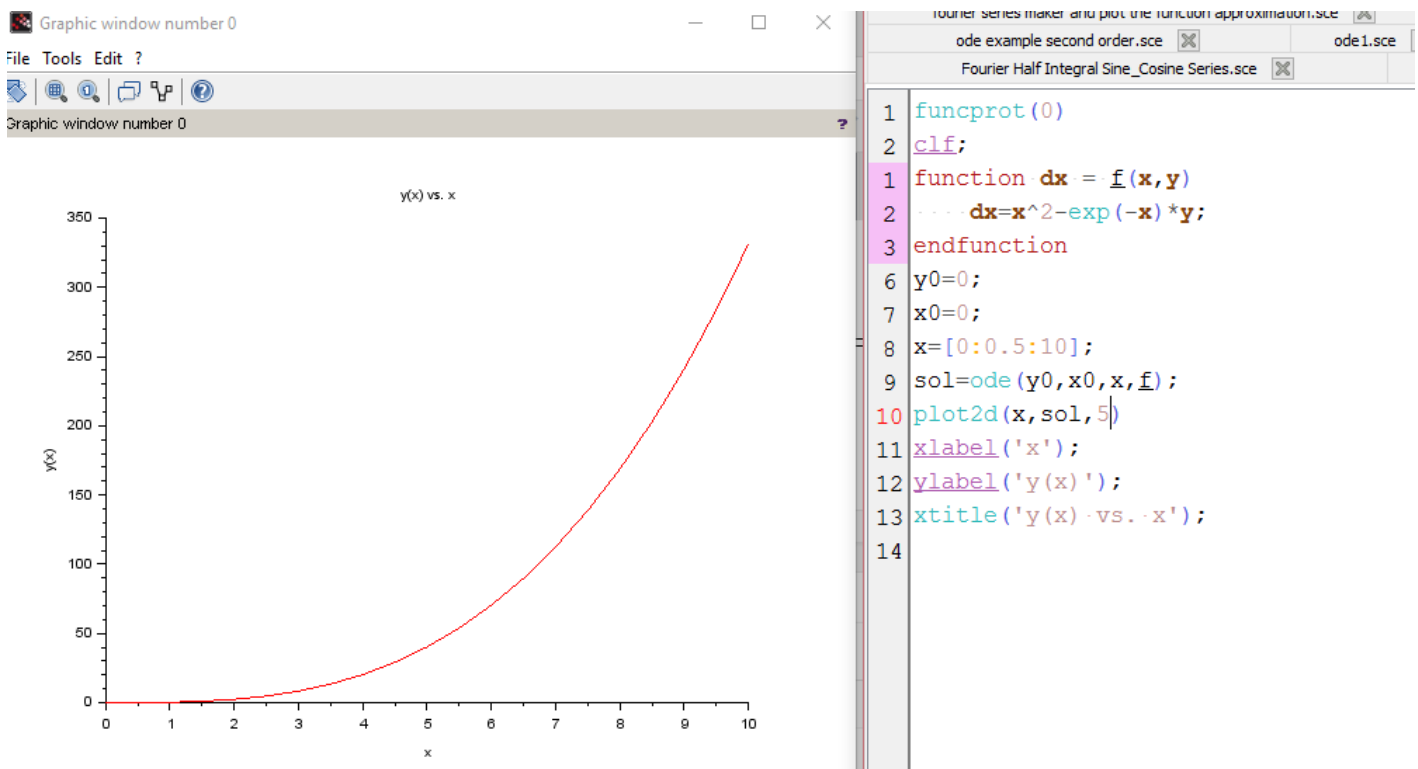
#2. $\frac{dy}{dx} + e^{-x}y = x^2$

```

funcprot(0)
clf;
function dx=f(x, y)
    dx=x^2-exp(-x)*y;
endfunction
y0=0;
x0=0;
x=[0:0.5:10];
sol=ode(y0,x0,x,f);
plot2d(x,sol,5)
xlabel('x');
ylabel('y(x)');
xtitle('y(x) vs. x');

```

Output:



Video:

If you're new to Scilab and are looking for some good quality tutorials then check out this playlist:



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