Q1. What is the behavior variable x(t) satisfying the linear 1st order differential equation dx(t)dt=cx(t), where c is a constant parameter, for varing values of parameter c? (x(t) is a scalar variable)

Solutoin:

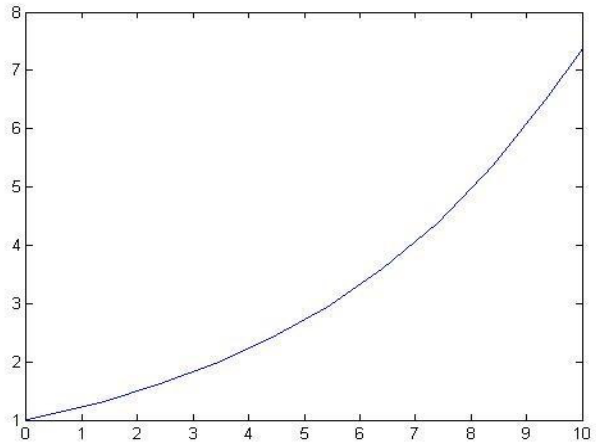
Script:

```
function dxdt = func(t,x,alpha)   dxdt=alpha*x
end
```

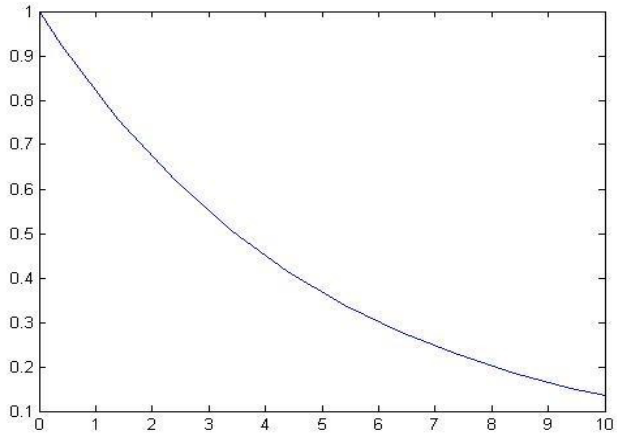
Command window:

```
[t,n]=ode23(@func1,[0:0.01:20],1.0) plot(t,n)
```

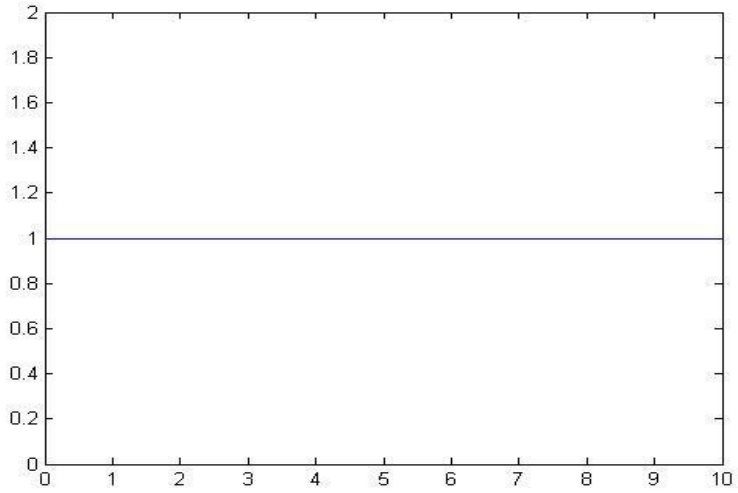
For alpha positive



For negative alpha



For alpha=0



Q2 . What is the behavior variable x(t) satisfying the second order differential equation second order differential equation $dx^2(t)/dt^2 = c\,x(t)$,where c is a constant parameter, for varing values of parameter c? (x(t) is a scalar variable) **Solution:**

Script:

```
function va = f(t,x) x0 =x(1)
alpha =-4 xdot =x(2) va
=zeros(2,1) va(1)=xdot;
va(2)=alpha*x0+0*xdot
```

Command window:

```
[t,x]=ode45(@func2,[0:0.1:20],[0 1]) plot(t,x(:,2))
```